

Dropout in Upper Secondary Education in Mexico

Patterns, Consequences and Possible Causes

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Abstract

This study examines the causes and effects of low enrollment and high dropout rates at the upper secondary level in Mexico, where upper secondary completion rates are well below those of other Organisation for Economic Co-operation and Development countries and the regional average. Through a disaggregated analysis of coverage, absorption, and dropout data in secondary education at the state level, the study categorizes states according to the stage in the educational cycle at which dropout primarily occurs. The study further examines the academic, social, and economic consequences of dropout through an analysis of employment and youth survey data. The analysis of factors associated with dropout uses self-reported factors as well as estimated probit models that use household data from national surveys and the national standardized test. The central conclusion reached is that in addition to

the patterns of dropout found, multiple elements intersect with the patterns to form a complex panorama. Key findings include: i) personal, family, and household economic factors and the prevalence of social risks have a closer association with dropout earlier in the education cycle; ii) the association between dropout and the quality of education has greater intensity in states where dropout occurs primarily during upper secondary education and in those with the lowest upper secondary dropout rates; and iii) as the returns to education grow, dropout is lower; in the case of returns to higher education, the association with dropout is stronger for states that have the highest dropout during upper secondary education. This complexity merits differentiated responses, which are explored through a brief look at relevant international approaches.

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Dropout in Upper Secondary Education in Mexico: Patterns, Consequences and Possible Causes

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Introduction

Recent studies by the Organisation for Economic Co-operation and Development (OECD (2010)) show that Mexico is one of the countries with the greatest growth potential to be gained from improvements in its education. Despite this, lagging educational attainment and education quality have hindered Mexico's ability to realize that potential. On the Program for International Student Assessment (PISA), Mexico has seen substantial improvements in test results in recent years (particularly between 2003 and 2009), but remains well below the average of all countries participating in the test, and below countries like Chile, which are of a similar development level. At its current pace of improvements in average years of education and test scores, it is estimated that it would take Mexico decades to reach levels registered in a country such as the Republic of Korea, which only 50 years ago had lower indicators than Mexico.¹

One of the biggest roadblocks faced by Mexico to accelerate educational improvement is found at the upper secondary level. In 2012, basic education coverage rates in Mexico exceeded 95 percent, a level similar to that observed even in developed countries. However, in the case of upper secondary education (USE), Mexico remains a country with low coverage and achievement rates – the current USE graduation rate in Mexico is 47 percent compared with an average of 84 percent in other OECD countries.² Even when compared to the Latin American average of 52 percent, the USE completion rate in Mexico is considerably lower: while only 37.5 percent of the population aged 25 to 29 has completed USE in Mexico, the completion rate for the region is considerably higher at 48 percent. The difference is also stark for older cohorts, with the USE completion rate for those aged 30 to 34 years standing at 32 percent while the regional average is 42.6 percent.³

The situation is particularly concerning because, in addition to dropout's negative effects on the productivity of human resources, the official age for attending USE in Mexico between 15 and 18 years of age is also a critical time in the life cycle for an individual's development. Given the pressing challenge and importance of USE today, addressing dropout at the upper secondary level is therefore a critical issue.

The present study provides a detailed analysis of USE dropout patterns in Mexico, explores its causes, and provides guidance in the design of public policies to address the problem. One of the cornerstones of the study is an understanding that dropout patterns and their origins likely vary in different circumstances and contexts; which implies that there is a need to use different combinations of programs and actions as appropriate.⁴

¹ Authors' calculations from household surveys and PISA results (estimated 23 years to achieve Korea's current PISA scores at Mexico's 2003-2009 rate of improvement; 25 years to reach average years of education in Korea at Mexico's current rate of improvement)

² OECD (2012) (http://dx.doi.org/10.1787/eag_highlights-2012-in-numbers).

³ Regional Monitoring Report on Progress Toward Quality Education for All in Latin America and the Caribbean, EFA 2012, UNESCO.

⁴ Several studies of USE in Mexico that focus primarily on the analysis of educational provision and its contents include Castañón and Dry (2000), Didou and Martínez (2000), Zorrila (2008) Zorrila, et.al. (2012). There are also several historical analyses of the evolution of the sector, including Solana, Reyes and Bolaños (2007) and Arredondo (2008). Unlike these studies, the present analysis focuses on the problem of school dropouts in the USE level, and to our knowledge, it is the first that addresses this problem by using the most current information.

The document is organized into five sections. The first presents evidence, both historical and recent, of USE dropout patterns and suggests a classification for different groups of states in the country. The second lays out new information on the current consequences of dropping out for youth in the academic, economic, and social spheres. The third section uses different data and statistical techniques to investigate the possible causes behind dropout in USE, including personal and family factors, social and community, and general or macro factors. The fourth section discusses possible approaches to tackle the issue, while the fifth provides some conclusions.

1. School Dropout Patterns in Mexico

Mexico has made significant progress in increasing educational coverage in recent decades. As Figure 1 shows, the primary gross enrollment rate (GER) has surpassed 98 percent since the early 1990s, while in the case of secondary, a substantial expansion was observed from 66 to 93 percent in two decades. In the case of USE, a significant expansion was also observed with coverage almost doubling in the span of 20 years, reaching 66 percent in 2012. Similarly, in higher education, coverage more than doubled in the same period.⁵

In USE, a similar trend has been observed in terms of the net coverage rate, which takes into account only the population of USE age. Figure 2, obtained from processing the National Household Income and Expenditure Survey (ENIGH) developed by the National Institute of Statistics and Geography (INEGI), shows that in 1984, 28 percent of the population between 15 and 18 years old attended USE, 18 percent were attending secondary –which is a lower level than expected for their age- and about 4 percent were still in primary. Since then, a continuous increase has been observed in the proportion of people in this age group that attends USE, reaching 59 percent in 2012, and a reduction has been observed from 18 to 11 percent of 15-18 year olds attending secondary.

The increase in coverage in USE is attributable to three main factors. The first is the expansion in supply of services at this level. The second is the increase in the coverage of secondary education, which implies that a higher percentage of individuals in each cohort have the academic requirements to enter USE. The third is that a higher percentage of graduates of secondary education access USE upon completion of secondary. Figure 3 illustrates these changes, by presenting the rate of absorption between each level of education and the following during the past two decades. For secondary, the absorption of primary graduates increased from 75 to 95 percent, while for USE the observed increase in absorption was from 83 to 95 percent during the same period – an increase by 14 percent. Also noteworthy is the increase from 70 to 80 percent in absorption in higher education.

Despite these advances, Mexico's education system has the largest dropout rates at the upper secondary level, which is the focus of this analysis. Figure 4 presents the evolution of dropout rates by education level between 1990 and 2012 and shows that historically rates in USE have almost doubled those recorded in other levels. In the span of 20 years, dropout has virtually disappeared at the primary level, has been reduced by 66 percent in secondary, but has only fallen by 30 percent in USE. In 2012, a USE dropout rate of 14.5 percent per year was recorded, which means that in the course of the three years covered by this level nearly 45 percent of original entrants dropped out.

⁵ Calculations based on the statistical information in SEP (2012). Note that these coverage figures refer to gross rates which are obtained by dividing the total enrollment at each level by the total number of people in the age group of reference in each case.

Figure 5 shows the implications of these trends by following the path of a typical cohort advancing through the educational system, taking into account the coverage rates, absorption of, and dropout from each of the levels of the educational chain. Using data from the Ministry of Public Education (SEP) (2012), for 2012 the cycle starts with virtually 100 percent of children of primary school age enrolled in this level. However, during the 6 years of this cycle 4 percent drop out, and 96 percent complete. The rate of absorption into secondary is 97 percent, which means that of the 96 students that completed primary, almost 93 continue. Of these, 84.5 percent culminate in secondary, resulting in the retention of almost 79 out of 100 original students. The rate of absorption into USE is 91.6 percent (i.e. of the 79 continuing students, around 72 are enrolled). However, high dropout rates in USE have resulted in only 45.6 of the original students completing this level. Finally about 85 percent of those who completed USE entered higher education, which means that for every 100 students entering at the start of primary only 39 remain in the educational system to enter higher education. The rate of terminal efficiency in higher education is 71 percent nationally, meaning that only 27 of the original 100 students who entered primary manage to get their degree.

Figure 5 compares the dynamics observed 20 years earlier, in 1990. During that year, the reduction in the population throughout the educational system was even greater and the rates of absorption and retention throughout the entire cycle were lower. One of the most notable phenomena is that in 1990, between the point of entry to USE and graduation, almost 16 of each 100 who had entered primary dropped out, while in 2012, 26.5 of every 100 original students left school during the same transition (see table in the lower section of Figure 5). This is due, on one hand, to a greater number of students gaining access to USE as a result of increased secondary completion rates as discussed above, but also the data clearly shows that USE did not evolve at the same rate, and in that sense has become a bottleneck for the national education system.

Four Patterns of Dropout

Table 1 shows secondary education coverage as well as coverage rates, absorption and dropout in USE. In analyzing information at the state level, four patterns emerge, which are then used in the subsequent analysis.

A first group, which includes Chiapas, Chihuahua, Guerrero, Michoacan, Oaxaca, Queretaro, Quintana Roo, and Tamaulipas, is mainly characterized by lower rates of coverage in secondary education. States in this group are classified as "*early dropout*" because they have low USE coverage largely due to a smaller percentage of youth completing secondary. This set of states has relatively high absorption rates comparable to those of other states (Table 1). Their low USE coverage is due largely to the premature departure of students from the education system even before secondary. Due to early dropout, only a minority reach USE age with the necessary academic requirements to continue their studies. Only between one-quarter and one-third of youth in the official age range make it to USE. We further find that the rates of entry to and exit from primary and absorption to secondary are virtually identical for the four groups, but the main difference of "early dropout" states is that a relatively small percentage of youth finish secondary, which results in less chance of further progress in the education system (Figure 6).

In a second group are Aguascalientes, Guanajuato, Jalisco, México, Nayarit, Sonora, Veracruz and Zacatecas, which we classify as "*dropout in transition*" since they have a higher percentage of youth leaving in the transition between completion of secondary and entry to USE. Table 1 shows that this set of states has secondary coverage of more than 90 percent, USE dropout rates comparable to the

group of “early dropout”, but USE coverage of only 63 percent largely due to having the lowest rate of absorption between secondary and USE. On average, in the states of this second group, 11.6 out of 100 original students entering primary education leave school during the transition between secondary and USE (Figure 6). This represents the highest dropout rate during transition among the four groups.

The third group is composed of the states of Baja California, Campeche, Coahuila, Colima, Federal District, Durango, Hidalgo, Morelos, Nuevo León, Tlaxcala, and Yucatán. These states register the highest average coverage rates in secondary and the highest rates of absorption to USE, but also the highest dropout rates during USE—almost 16 percent on average. This group is labeled as “dropout *during*” USE. The subset of states in this group with the highest dropout rates in USE, with levels above 17 percent, includes the Federal District, Nuevo Leon, Yucatan, Coahuila and Morelos. The rate of secondary education retention in this group is considerably higher than in the “early dropout” and “dropout in transition” groups (Figure 6). Even before entrance to USE, in this group almost 80 of every 100 students, on average, who originally entered primary remain enrolled until upper secondary, while in the “dropout in transition” group only 70 remain. However, among this group of states, upon arrival to USE a high dropout rate is recorded with an exit of more than 30 of every 100 students, on average, to the extent that only 45 of 100 original entrants complete upper secondary, a number equivalent to that observed in the group of “dropout in transition.”

Finally, the fourth group includes Baja California Sur, Puebla, San Luis Potosi, Sinaloa and Tabasco, which we categorize as “*lower dropout*” as they record an average annual dropout rate of 11.2 percent. A greater percentage of students than in the previous three groups manage to complete USE—this is the only group in which more than one-half of the students who originally entered primary finish USE—and the coverage rate is over 70 percent (Figure 6).

Figure 7 and 8 also reveal concentrations in various states. In particular, 80 percent of youth who leave the education system after having completed secondary education—and who are not enrolled in USE—are in six states: the State of Mexico, with nearly 30 percent of the total, Veracruz, Oaxaca, Guerrero, Chiapas and Guanajuato (Figure 7). A policy to address dropout issues targeting these states would likely have a significant national impact on dropout in transition. Furthermore, nearly 50 percent of youth who drop out after entering USE are concentrated in seven states—the State of Mexico, Federal District, Jalisco, Veracruz, Guanajuato, Nuevo León and Puebla (Figure 8). Therefore, actions that directly affect retention in USE in these states would address almost one-half the volume of dropout in the country.⁶

Educational Profile at the Typical Age of USE Completion

Due to the high dropout rates, at age 18 a high percentage of youth in Mexico have a lower educational profile than would be expected given their age, or are still in school despite having exceeded the official age for enrollment.

To illustrate the magnitude of these lags we analyze data from the National Household Income and Expenditure Survey 2012, which identifies the activities and the school attendance profile for youth

⁶ Additionally, the analysis of the recent National Education Survey of School Dropout (ENDEMS), which we discuss in detail below shows that the highest dropout rate in USE is in the first year, and this represents 60.8 percent of the abandonment of USE. Nationally, the intra-curricular attrition (during the school year) is 57 percent of the total attrition, while the inter curricular dropout (between school years) is 43 percent.

who continue in education and those who have already left—the previous subsection used data from the SEP which includes only individuals registered in the education system.

The results are presented in Figure 9. The first three indicators show the percentage of population aged 15 to 18 who do not attend school and identify the educational grade they achieved. According to our calculations, nationally 35 percent of youth between the ages of 15 and 18 do not attend school, and of these almost one-half—16 percent – finished only primary or incomplete secondary and so will not have the opportunity to enter USE. The remaining group could enter USE as they have fully completed secondary, but do not do so for other reasons.

The classification of states in the four groups, as described above, highlights some variations. The first is that in the states with early dropout, a significantly higher 18 percent do not attend school and have only completed primary education, while in the remaining three groups the average is between 10 and 12 percent. Also, the percentage with only incomplete secondary is also markedly higher in the “early dropout” and “dropout in transition” states, covering more than 17 percent of youth, in contrast to 13 percent in the states with lower dropout.

At the other extreme, there are also significant differences among the groups in terms of the percentage that completed USE or continued in it. In this case, the percentage in the group of “lower dropout” is 38 percent, compared with levels of 30 and 33 percent in the “early dropout” and “dropout in transition” groups.

The data from the ENIGH 2012 also provides the opportunity to explore the type of activity—school, work, or other—that prevails in different groups. Figure 10 presents a breakdown for the population between 15 and 18 years for the four groupings of states. The first set of columns contains the percentage of youth whose only activity is to study. While in the “early dropout” group the ratio is 60 percent – reaching 62 and 66 percent in the “dropout in transition” and “dropout during USE” groups – it reaches 70 percent in the group of “lower dropout”. Among the youth who are not in education but who work, the opposite pattern is revealed. Also, in the first three groups the percentage of youth who neither study nor work is around 16 percent, while in the “lower dropout” group it reaches 12 percent.

2. The Consequences of Upper Secondary Dropout

Dropout from USE has a wide range of consequences. In this section we document the magnitude of those for which data is available in the academic, economic, and social areas.

Academic Consequences of Dropout

The most direct consequence of having a large number of dropouts in USE is that since the learning process is cumulative, noncompletion of this level prevents transition to the next (higher education - HE). Even at the national level, according to the official data available the rate of absorption of HE is 85 percent nationally indicating that the majority of USE graduates enrolled in Higher Education. The reason that a reduced proportion of students relative to those who originally entered the education system ultimately reach higher education is dropout before or during USE as illustrated in Figure 6. Therefore, it can be argued that satisfactorily completing USE in Mexico is accompanied by a high probability of access to higher education.

Figure 11 shows the absorption rate to higher education by state, and illustrates several interesting facts. The first is that with the exception of Chiapas, which recorded a rate of 40 percent, in all Mexican states most USE graduates progress to higher education. The three states with the lowest rates of absorption are Chiapas, Guerrero and Oaxaca, which belong to the group of “early dropout”. With the exception of these three cases, all states recorded absorption rates of 60 percent or above, whereby almost two of three USE graduates enter higher education. Notably, half of the states registered absorption rates exceeding 90 percent.

A second important fact is that absorption into higher education increases as dropout from USE is delayed. Among the states characterized as “early dropout”, absorption to higher education is 77 percent, but reaches 90 and 94 percent on average among states grouped as “dropout in transition” and “dropout during USE”, respectively.

A third interesting fact is that despite these general patterns, the relationship between dropout and absorption rates is nonlinear. States like Quintana Roo, a state with early dropout, and Aguascalientes, which is classified as a “dropout in transition” state, have rates of absorption to HE greater than 100 percent. Moreover, in states like Puebla, which belongs to the group of states with lower dropout, a lower absorption rate of about 80 percent is recorded.

Economic Consequences

In addition to the academic consequences of limiting HE entry, dropout from USE affects a youth’s ability to access better economic opportunities, since HE generates higher returns in the labor market. To verify the level of the spreads between returns, we estimate the returns to different educational levels using data from the National Employment Survey (ENE) from INEGI for all individuals aged 19 to 45 who receive an income from employment (including from the formal and informal sectors). This source includes information for all participants in economic activity as well as their level of education.

Figure 12 presents our estimates of the returns to HE relative to both secondary education and USE.⁷ As expected, the returns to HE relative to previous levels are significantly higher. Having HE is associated with income levels about 3.5 times greater than those observed for individuals with only secondary education, and twice those who completed only (at best) USE.

Spreads in earnings between HE and secondary vary considerably, from about 5 times in states such as Nayarit, Nuevo Leon, Federal District, Baja California Sur and the State of Mexico, to about 3 times in Veracruz, Puebla, Hidalgo, and Guerrero. However, in the case of differences between HE and USE, with some minor variations, the earnings are around two times higher.

Figure 13 shows the differential between the returns to completing USE versus those of reaching USE but exiting before graduation. According to our estimates, on average the income of an individual who completes USE is 61.5 percent greater than his or her counterpart who dropped out prematurely from this level. Our results further show that there is considerable variability by state. On the one hand, in states such as Chihuahua, Guanajuato, San Luis Potosí, Querétaro, Federal District, Tlaxcala and Colima, completing USE is, on average, associated with an income two times

⁷ We estimate the returns individually by a traditional Mincer equation for individuals who report labor income, and correct for selection bias.

greater than the income of youth who did not complete the level. At the opposite extreme are Oaxaca, Campeche, Coahuila and Tamaulipas, where an individual's income is about 20 percent greater than his or her counterpart who did not complete USE.

To provide an overview of the most immediate consequences of dropping out before completing USE we explore data from the National Survey of Educational and Labor Trajectories of Higher Secondary Education 2008 (ENTELEMS) and the National Survey of Educational and Labor Trajectories of Higher Secondary Education (ENILEMS) from 2010 and 2012. Both surveys are specifically designed to study the working conditions of different populations, so the data can provide insight into the consequences of not completing USE.⁸

Analysis of these issues (insofar as they relate to participation in and completion of USE) is useful since the majority of youth who exceed the age for participation in USE (18 – 23 years of age) do not continue in the education system. One would expect that a significant portion of them would still seek entrance into the labor market and would assume that their educational background will influence the opportunities available to them. In particular, a relevant question for this analysis is the extent to which finishing USE or not facilitates labor market insertion.

A first indicator of interest is the difference in employment rates between those who completed USE and those who exited before graduation. According to our estimates, the employment rate of those who did not complete USE and were not enrolled (at the time of the survey) in higher education was 45 percent, while among those who did complete USE the rate was of 60 percent. Table 2 presents the information by state and shows that the differentials reach about 30 percent or more in Chiapas, Oaxaca and Querétaro. On the other hand, in Coahuila and Nuevo Leon discrepancies in the employment rate are below 10 percent.

Another distinct pattern was identified in terms of the types of employment observed. According to our results, only 37 percent of employed individuals who did not complete USE are employed in the formal sector, while among those who did complete USE the share is almost 50 percent. This difference suggests that completion of USE is associated not only with employment but also with employment in better conditions. As seen in Table 2, significant variations in formality of employment are observed, ranging from differentials of more than 20 percentage points of greater formality with full USE in Campeche, Michoacan, Morelos, Chiapas, Yucatan, Oaxaca, Zacatecas and Tabasco, to discrepancies of less than 10 percentage points in the Federal District, Nuevo Leon, Baja California, Durango, Chihuahua and Coahuila.⁹

⁸ In fact, ENILEMS focuses precisely on the group of interest for this paper, and even incorporates qualitative information on perceptions that graduates themselves have of the USE received.

⁹ To explore in more detail the effect of finishing and graduating from USE compared to not having completed this level, we estimate a series of probit models including as independent control variables household characteristics, income, characteristics of the head, spouse characteristics, asset values, etc. We estimate a traditional regression of logarithm of income as a function of those variables and include dummy variables indicating USE completion, and find that finishing USE is positively and significantly associated with the odds of finding a job and finding employment (of 7 percent in both cases), and of obtaining a higher income in the labor market equivalent to 17 percent.

Social Consequences

As for the social consequences of school dropout before the typical age of USE completion, the National Youth Survey (ENJ) 2010 includes information on sexual behavior, alcohol consumption, drug use, and other behaviors, in youth, which can be associated to schooling patterns.¹⁰

In order to explore associations between these types of high risk behaviors and dropout from the education system, we estimated a series of Probit regressions where the dependent variable was the risk behavior or practice under analysis in each case, for youth ages 19 to 24. As independent variables we consider economic status and household structure—both of which are generally identified as important determinants of social risks—as well as a variable indicating whether the individual in question dropped out of the education system before completing USE and before reaching age 18.

It is important to note that the survey includes information on self-reported behaviors, which tend to be under reported, likely leading to underestimation of the magnitude of the true association between dropout and the risk being studied. Further, although we provide estimates for youth who have transcended the age of USE, there is likely to be endogeneity between variables, as dropout during the age of USE (15 to 18) may have been caused by the proclivity to begin engaging in risky behaviors which are included in the estimates as dependent variables. For this reason, our estimates should be interpreted only as associations and correlations, and not as causal relations.

Table 3 presents the results for each of the 6 estimations. In all cases, the first independent variable is a dummy variable that takes the value 1 when the individual in question left the education system before completing USE. We then incorporate a set of personal variables including gender, age, and marital status, followed by access to scholarships and medical services, household characteristics and assets, and the features of the head of household.

In the first two estimations the dependent variables attempt to capture information on the stability in interpersonal relationships to inquire whether the individual in question has suffered partner violence, or has been forced to engage in sexual activity. In the second regression our estimates show a positive and significant association with dropout. The third estimate verifies the relationship between teen pregnancy or parenthood before age 18 and dropout before completing USE. In this case a positive and significant relation is found. However, it is this latter model where potential endogeneity may exist as described above.

Three additional estimates refer to different types of addictions observed among youth between the ages of 19 and 24 years, including information on the frequent use of cigarettes, alcohol, and drugs. In all cases the coefficient is positive and statistically significant suggesting that there is an

¹⁰ The National Youth Survey was implemented in 2010 and was applied to a representative number of households on the condition that there was at least one young person (12 to 29 years old). In these households a youth was chosen to answer an expanded questionnaire (with information on dropouts, and social issues related to sexuality, violence, and addiction) while other household members were given a basic module of socio demographic characteristics. The survey has coverage at national, regional, and state / municipal levels and for metropolitan areas. The USE dropout level estimated from it is 11 percent per year, which is lower than the 14 percent recorded by official statistics discussed in Section 1 of this document. Given the characteristics of the sample it is likely that the discrepancy is due to sub declaration of dropout rates given by the fact that some youth who are outside the education system cannot be seen as deserters by having the intention to return in the future

association between the prevalence of addictions and dropping out of the education system prematurely before completing the USE level.

In sum, the data show that the propensity to addictions and exposure to differential risks at post USE ages, tend to be higher when individuals dropped out at ages 15-18. Despite being interpreted only as associations without implication of causality, this finding is relevant for several reasons. The first, as mentioned, is that the prevalence of risky behaviors among youth in surveys that rely on self-reporting tends to be under reported, so it is likely that the actual association is even stronger. The second is that in Mexico there is little statistical information at the national level on the social consequences of dropping out of school. Our results may highlight the need to further investigate these kinds of effects. The third relates to the implications for educational policy and for at-risk youth strategies. For instance, for health policy and health care for youth, it would be important to use early dropout as a potential risk factor for poor or compromised health and well-being.

3. School Dropout and Associated Factors

There is an extensive body of literature on the causes of dropout in the context of the risks that youth face. In general, three broad types of factors associated with this condition are observed: personal-family, social-community, and macro or general.¹¹

The first of these refers to the set of personal and family characteristics that determine individual behavior. These range from biological characteristics such as gender, race, or ethnicity, to cognitive abilities, personality, psychological, and behavioral characteristics. Family factors relate to personal interactions with other family members—those who live inside or outside the home - and to the resources available to the family unit.

On the other hand, social-community factors have to do with the quality of education services, health, protection, infrastructure, and security, which determine the context in which people operate, as well as the influence of the environment and social groups within it. The inadequacy or lack of services, including the quality of education is a risk factor in itself, and can also be triggered from exposure to other vulnerabilities.

The third group of factors (macro or general) relates to the context and institutions that affect individuals. However, unlike in the personal-family and the social-community groups, this group includes factors that generally are not affected or modified by individual behavior and are taken as external, such as macroeconomic conditions, inequality, laws, cultural patterns, and labor market dynamics. In this section we explore the importance of the three groups of factors.

3.1 Self-Reported Causes of Dropout

Before discussing individual analyses of each of the three groups of factors, we first take an overall look at youth's own reporting of reasons for school dropout. In a recent study by Alfonso, et.al. (2013) it is shown that among a representative sample of youth who dropped out before completing USE in 8 Latin American and Caribbean countries, the main cause for dropping out (32.2 percent of the respondents) is lack of interest and considering that schooling does not provide useful or quality elements. These causes are related to the social-community factors mentioned above and are

¹¹ See, eg, Cunningham, et.al. (2008) or World Bank (2003).

particularly related to the quality and relevance of educational services. In 6 out of the 8 countries studied, disinterest and lack of relevance are identified as the primary causes of dropout, with more than 40 percent. Even in Guatemala and Paraguay where it was not identified as the primary cause of dropout, it was still the second most cited reason.¹²

According to the same study, the second leading cause of dropout reported by youth themselves was their economic situation, with 22.7 percent. The third most commonly cited cause of drop out (among 19 percent of respondents) included household obligations, pregnancy and child care. The fourth most reported was work obligations, with 14.5 percent. Only 4 percent indicated that they were not attending USE due to lack of services.

In the case of Mexico there is similar information from the 2005 Population Census, which explicitly asks about the causes of non-attendance for school children under 18 who are not in the education system. The Census data reveal a picture similar to that described above. The main cause of dropout from USE for 28 percent of the population is "lack of interest in school." Economic factors are cited as the main cause by 24 percent, while household activities, pregnancy and caring for other household members are cited as the main cause by 18 percent.

In 2011, the Ministry of Education conducted the National Survey of Dropout in Upper Secondary Education (ENDEMS), which is the first instrument specifically designed to identify the causes of this phenomenon in Mexico. The survey included a sample of 13,014 youth between ages 14 to 25, and is nationally representative. An important aspect of the sample specification is that the selection of clusters took into account 10 geographic areas or regions.¹³ The database of the original micro data that was used for this analysis identifies the origin of each cluster observation, and the number of relevant observations, so that descriptive statistics by region can be estimated by calculating confidence intervals for each regional average to establish the statistical significance of the difference.¹⁴

Table 4 presents the patterns observed in the ENDEMS nationally and in each of the regions. In the case of the regions we identify those that are significantly different from the national average by an asterisk. In addition to estimating the mean differences for each of the 22 items separately, we aggregate the proportions in each of the three general categories of economic, educational and personal factors respectively and perform the same test of mean difference as in the individual cases.

For 36.4 percent of respondents at the national level the main cause of dropout from USE was the lack of financial resources to cover the expenses of attending school. For 29.5 percent the main

¹² Countries for which the authors provide information are Bolivia, Costa Rica, Colombia, El Salvador, Guatemala, Honduras, Dominican Republic, and Paraguay.

¹³ The 10 regions in which the states are grouped are Peninsula and the Northeast (including Baja California, Baja California Sur, Sonora and Sinaloa), North Central (includes Durango, Chihuahua and Zacatecas), Northeast (includes Coahuila, Nuevo Leon and Tamaulipas), West (includes Colima, Jalisco, Michoacan and Nayarit), Center (Aguascalientes, Guanajuato, Querétaro and San Luis Potosí), Metropolitan (with the Federal District, State of Mexico and Morelos), East Central (Hidalgo, Puebla and Talxcala), Eastern Gulf (with Tabasco and Veracruz), South (Chiapas, Guerrero and Oaxaca), and Southeast (Quintana Roo, Campeche and Yucatan).

¹⁴ Given that the sampling process is probabilistic, stratified, multistage, and clustered, it is possible to estimate average and other indicators for each of the clusters separately, establishing confidence intervals of the point estimate in each case. These can be used to test hypotheses of differences between the national sample and regional data, by estimating adjusted standard errors since sampling is non random, but corresponds to a particular geographic unit.

cause for dropping out was related to academic and school issues, including difficulties understanding the teachers, dislike of studying, failing subjects, and assignment to a different shift than desired, among others. Finally, the third main cause was related to personal causes, with 23.1 percent. Personal causes included pregnancy, considering that work was more important than staying in school, or quitting school to get married. Table 4 further highlights differences in motives that were observed by regions.

In addition to the ENDEMS, the National Youth Survey (ENJ) 2010 includes a specific module useful for identifying the causes of dropout. This survey is further representative at the state level, which allows verification of whether the causes of dropout reported by the youth differ in states classified by their pattern of dropout.

Table 5 presents our results grouping the causes of dropout (similar to the results of the ENDEMS) with classifications by state—however, in this case we also differentiate a group of causes that deal with educational provision, for which the ENJ incorporates a number of specific variables. The picture which emerges when analyzing data from the ENJ is somewhat different than that found using the ENDEMS. One of the main findings is that the leading category of causes of dropout (reported among 42.6 percent) of youth aged 15 to 18 is educational factors. Among this group 15.9 percent of youth declare leaving because they were bored, 13.1 declare that they did not want to continue their studies because they were not relevant, and 9.6 percent mentioned that they left school because of repetition or being over age.

The second most common grouping of causes for dropping out at the national level was related to economic factors. Among more than one-third (35.5 percent) of youth surveyed, the main reason for dropping out included having to work, lack of money, or being unable to pay for school. The third grouping refers to personal circumstances (including marriage/union and paternity/maternity), which combined account for about 8 percent. Finally, the fourth group of causes (with 7.5 percent of all mentions) includes aspects that have to do with the educational supply and the lack or difficulty of access to educational services.

Another important finding is that when analyzing states according to the typology described earlier, marked differences are apparent. For example, among the states characterized as “early dropout”, economic causes are the most important with 43.8 percent of respondents, followed by school-educational reasons with 35.9 percent, while personal and educational supply issues together amount to about 14 percent. For states categorized as “dropout in transition” and “dropout during USE”, however, the main causes cited have to do with school-educational reasons with about 42 percent in both cases— a difference in this area is that a higher percentage of youth in the “dropout in transition” group leaves school for failing subjects. Both groups also have similar percentages of youth dropping out for economic reasons, with 37.2 and 35.4 percent, respectively—and for personal reasons, with about 8 percent in both cases. The percentage that dropped out due to lack of provision is 8.2 in the “dropout in transition” states, and 6.3 percent in those who are in states categorized as “dropout during USE”.

In the case of states categorized as “lower dropout”, a similar pattern is observed, but with different proportions. This is the group for which a higher percentage of dropouts are for school-related reasons, with 46.7 percent and a smaller percentage -29.1 percent- for economic reasons. In the academic category, this is the group of states where a higher percentage leaves school for failing subjects, with more than 10 percent.

In sum, both the ENJ and ENDEMS reflect that the causes of dropout may vary geographically, and that there is considerable variation throughout the states of Mexico. In addition, the ENJ reveals that economic causes prevail as school dropout is more premature, while school-educational reasons prevail as that dropout is later. This clearly points to prioritizing different public policies and interventions in different circumstances, with greater emphasis on interventions to support the family economy in cases of early dropout and with a priority focus on academic and school issues during transition and retention in USE.

3.2 Personal, Family, and Economic Factors

In order to explore the importance of personal, family and economic factors with respect to dropout we estimate a probit model using household data of each youth of USE age from the ENIGH survey. The estimation corresponds to the marginal effect of each feature on the likelihood of having dropped out of USE. As a first step we estimate a basic model using existing ENIGH data between 1984 and 2012, which contain a relatively limited number of comparative and available variables in each survey, but allow us to obtain an overview of the importance of various elements over almost three decades. Figure 14 presents the results at the national level, and shows that there are significant changes over the years — we include only variables that consistently show a statistically significant effect.¹⁵

Female gender was the characteristic most strongly associated with the probability of having dropped out of the education system by USE age in the 1980s but has since undergone a dramatic shift. The magnitude of the coefficient has decreased, to the extent that in 2012 being female was associated with only a 5 percent higher probability of dropping out. This reduction may be related to increased female labor force participation, cultural changes, and even the incentives offered by the *Oportunidades* program, which provides higher levels of financial support to women conditional on their school attendance.¹⁶

The second variable most strongly associated with dropouts during the period analyzed is the employment status of the head of household. According to our analysis, an unemployed head of household is associated with a 12 percent higher probability of dropping out of USE. This association is maintained at similar levels over nearly 30 years. This might be because USE age coincides with being of legal working age, which presumably increases the short-term opportunity cost (not being able to generate income) of staying in the education system.

In the early 1980s, a number of factors were associated with dropout including having a female headed household and having youth of USE age being head of household (Figure 14). The value of the coefficient of gender of household head has decreased steadily, reaching about 4 percent. This can be related to increased female labor force participation in Mexico, since the gender gap in returns to education has also been reduced. In contrast, the coefficient related to youth of USE age being head of household increases, reaching values of about 10 percent in 2012.

¹⁵ The original model uses a dummy variable for school attendance as the dependent variable, and independent variables including socio demographic characteristics of the household, the existence of various assets, housing characteristics, and information about the prevailing economic activity. Because of the potential problems of multicollinearity and endogeneity among variables, the marginal effects should be taken only as patterns of association without necessarily having a relationship of strict causality.

¹⁶ Fiszbein and Schady (2009) show that such effects of Conditional Cash Transfer programs on gender equity in school attendance, are observed repeatedly in several countries.

The other two features that show statistically significant associations over the three decades under analysis are the employment status of USE age youth and household size. As expected, youth that are working are less likely to attend school. With regard to household size, the positive association between household size and dropout may be due to the fact that the economic and time needs of the household generally increase as the household size is greater and it is common for these responsibilities to fall on the economically active household members, which usually includes youth over 15 years of age.

The variables that reduce the likelihood of dropout (and which consistently show significant effects) are educational level of the head of household and household income. These associations are not surprising as both are related with greater ability to invest in human capital. Of these two variables, household income is the strongest factor negatively associated with dropping out, and has a coefficient with the most considerable magnitude of all variables incorporated (incomes generated by individuals aged 15-18 are not considered in the estimation). Interestingly, in the early 1980s the marginal effect of income on the probability of dropout was nearly 30 percent, and its value systematically decreased during the course of the following decades. Even so, by 2012 the value was still about 15 percent nationwide. This result is consistent with the assessment of the ENDEMS that economic resources are strongly associated with dropout.

Figure 15 presents the results of estimating a broader model both nationally and for the four groups of states (classified by types of dropout) using 2012 ENIGH data, which are representative at the state level.¹⁷ The estimates show significant differences by groups of states.

One important result is that speaking an indigenous language is positively associated with dropping out before completion of USE and this association is statistically significant. Notably, the effect is greater when dropping out from the education system occurs earlier, with coefficients almost double the size between states categorized as “early dropout” compared to those with lower dropout. In fact, among the variables that show a positive relationship with dropping out, speaking an indigenous language is among those with the strongest association.

Another result, aligned with the previous sub-section, is that economic factors are also important (e.g., association between level of income and dropping out of school). For states that are characterized as “early dropout” these effects are greater, and they are reduced significantly, almost halved, as dropout is observed later in the educational cycle. This estimate further incorporates an index that represents the value of household assets, which also has an important negative association (the greater value of assets the lower the dropout) although this has a lower value and is without significant changes between groups of states.

The 2012 ENIGH data also provide information on access to some social programs and public services. In particular, participation in the *Oportunidades* program is included as an independent variable in the estimation, with a significant negative effect on dropout, even higher than the index of household assets. In this case, however, differences are not observed by state group. This is an

¹⁷ In this case we estimate a model with additional variables without facing constraint of comparability for the period 1984-2012 as a whole, as was done for the estimation presented in Figure 14.

expected result since *Oportunidades* influences decisions related to schooling by increasing household income and by establishing attendance as a condition for support.¹⁸

Additionally, we incorporate urban or rural location (of the household) as an indicator that approximates, *inter alia*, access to basic services in a broader sense. We find that being located in a rural area significantly increases the probability of dropping out before completing USE and that the effect is lower when dropout is observed at later stages of the education cycle.

The strength of the association between dropout and access to health services is similar to that observed between drop out and rural location of residence – but in the opposite direction. That is, greater access to such services is associated with a lower likelihood of dropping out. This may be because better health is associated with higher educational achievement and vice versa, but it may also be capturing an additional effect of the correlation between the supply of public services in education and health. Interestingly, the association between access to health services and dropout is stronger for states characterized as “early dropout”, and decreases in states characterized as “dropout in transition”, “dropout during USE,” or “lower dropout”.

We also incorporate some additional features of the household such as the occupation and education of the head, and household size. As expected, having an unemployed head of household increases the likelihood that a youth of USE age will drop out, and the strength of this association is greater when an individual drops out earlier (as indicated by the variation between the groupings of states). In contrast, household size records a less intense association and is without significant variations between groupings of states.

Finally, higher education levels of both the head of household and his or her spouse has a significant negative effect on dropping out – and the strength of this association grows as dropout occurs later. Our estimates show a stronger association between the education level of the spouse than with the head of household.

In sum, the information available suggests a significant association between a number of personal, economic and household characteristics, and the likelihood of dropping out. These factors vary in intensity in different circumstances, further confirming that many different patterns and associations of this phenomenon are observed in Mexico.

3.3 Social-Community Factors

Of the elements identified by the youth who have dropped out of school and are recorded in the ENJ and ENDEMS, it is clear that their immediate social context influences their opportunities and therefore, their decisions to remain in the education system. In the following sections we use information obtained from several databases to analyze statistical information on three groups of such factors: i) school factors, ii) social risk, and iii) community aspects.

¹⁸ Fiszbein and Schady (2009) present evidence from impact assessments of the impact of conditional cash transfer programs, including *Oportunidades*, on school attendance, that are consistent with these conclusions.

School Factors

Several studies have documented the influence of school factors on the quality of education and on the incentives they generate for individuals to stay in the education system. Cabrol and Székely (2012), for example, include evidence of the association between the level of preparation of teachers, educational infrastructure, materials, content and approaches, technology and teaching methods, etc., on educational outcomes for a group of Latin American countries.

In the case of Mexico, the results of the ENJ and ENDEMS clearly show that for youth who drop out, dissatisfaction with education services offered is central to the decision. These perceptions are corroborated with information captured by the ENILEMS in which students graduating from USE are directly asked about their perceptions of educational quality. This data reveals that the proportion of students indicating that USE *was not* useful for their transition to employment in 2010 was 20 percent in vocational education, 27 percent for the professional track and 41 percent for general USE. By 2012 those proportions grew to 25 percent, 34 percent and 42 percent, respectively. The ENDEMS also includes information identifying the association between dropout and some educational features.

One source of information that can be used to analyze the association between dropping out and the quality of education is the ENLACE test, which is applied annually across Mexico from the third grade of primary until the end of USE.¹⁹ It is interesting to note that in general, academic achievement tends to be lower in states where most dropout occurs prematurely. Figure 16 shows this in the aggregate. For states categorized as “early dropout”, the percentage of students with insufficient knowledge of mathematics and Spanish is more than 50 percent, and the percentage drops especially for math, where the proportions are reduced to 45.3 percent, and 44.6 percent in states characterized as “dropout during USE”, and “lower dropout”, respectively.

Another important element is the quality of the school environment. To this end, in 2008 and 2010 the Ministry of Education conducted the National Survey of Exclusion, Intolerance and Violence in public upper secondary schools (ENEIV) which provides insight into the dynamics experienced by youth who have stayed in the education system.²⁰ The survey results highlight a low level of tolerance of diversity among Mexican youth. For example, according to our estimates, there is a significant percentage of students who said that they would *not* like to have people with certain characteristics as a friend or classmate in school including those living with HIV-AIDS, people with non-heterosexual preferences, or persons with disabilities. Just under one-half (47.7 percent) of students surveyed said they did not want to have an Indigenous person as a classmate. Furthermore, significant percentages have committed or experienced violent behavior —40 percent report having assaulted their classmates in some way and about 40 percent say they have been assaulted by their peers.

¹⁹ ENLACE is the National Assessment of Educational Achievement in Schools, applied annually by the Ministry of Education.

²⁰ The survey was conducted by the National Institute of Public Health on behalf of the Ministry of Education to youth who are studying Upper Secondary Education in the country. The survey includes a sample of 13,104 public school students between 15 and 19 years of age, representative of the universe at the national level. The survey provides evidence on family and social relationships, attitudes towards diversity, self-esteem, personal relationships, risks, safety, attitudes on gender, sexuality, and social environment, among others.

Information about the state of mind of the population between 15 and 19 years of age in public USE indicates alarming issues (especially among women). When asked if they felt life “is not worth living”, 28.7 percent of men and 42.6 percent of women answered affirmatively; while similar proportions indicated that they have experienced situations that "have made them wish they did not live any longer", and 19 percent of men and 30.5 percent of women thought that "it is more worthwhile to die than live". Finally, 8.5 percent of men and 16.8 percent of women declare they have been about to commit suicide and 11 percent of women reported having hurt themselves with the aim of committing suicide.²¹

Social Factors

An advantage of the ENJ is that it simultaneously offers information about social risks and retention in the education system. As a first step, we process the ENJ data limiting the sample to the population aged 15 to 18 years and comparing the patterns observed among youth who attend school and those who have dropped out.

Figure 17 shows clear differences between the two groups. For example, it appears that among youth who have dropped out of school 35 percent live in a household in which the father is absent, while the rate among those who remain in school is 24 percent. According to our results, 13 percent of dropouts aged 15 to 18 live with their partner while only 5 percent of those who remain in school are in this situation. Additionally, 45 percent of those who have left the education system had engaged in sexual activity before age 15, while the prevalence among those who continue is 27 percent. There are also important differences between the two groups in terms of the percentage of those who have caused or experienced teen pregnancy; those with children; and those who smoke and drink alcohol regularly, with prevalence higher among those who drop out compared to those who are still in school. The percentage who reported having used drugs is three times higher among those who are no longer in USE than among those who continue, although as expected, the declared consumption rate is low.

Figure 18 shows a similar breakdown of data by groups of states. For example, the first set of bars indicates that in the four groups the percentage of students who live at home (where a parent is absent) and have dropped out of school is about double relative to those still in USE. In this case differences between the four groups are insignificant. Differences are also minor between groups of states in terms of the proportion living with a partner, of those who have had sex before age 15, and of those who have been forced to engage in sexual activity. The variables for which there is most variation observed in the difference in prevalence between dropouts and non-dropouts between groups of states include: experiencing partner violence, having children, causing or being subject to teen pregnancy, and regular drug use. Interestingly, for the variables smoking and drinking alcohol regularly the highest spreads between dropouts and non-dropouts are observed when dropout occurs earlier in the education cycle.

In order to identify more precisely the association between dropping out (when of USE age) and social factors we estimate a probit model controlling for variables similar to those discussed in Sub

²¹ The school environment may even be an important determinant of dropout at earlier ages. For example the results of the International Civic and Citizenship Study conducted in 2009 by the International Association for the Evaluation of Educational Achievement (IEA), show almost half of secondary students in Mexico do not feel any empathy with peers, over half show an intolerance to diversity, less than half expressed a sense of identity with their country, and almost half reported having been abused or beaten by a classmate within the school.

Section 3.3, and we further add various risks for which we have information from the ENJ.²² Table 6 presents our results both nationally and for each of the groups of states.

One key finding from this analysis is that although the magnitude of the coefficients varies, we obtain generally similar results in terms of sign and significance for a number of indicators (e.g., household location, access to health services, education of the household head and spouse, speaking an indigenous language, the household asset index—in this case the income variable is not included as it is incomplete in the ENJ—and participation in the *Oportunidades* Program) and their association with dropping out.

In addition to these variables, we also explored the association between risk indicators and social behaviors of interest and dropping out. While it is not possible to determine the directionality, our analysis finds that nationally there is a positive and statistically significant association between dropping out and having engaged in sexual activity before age 15, having been involved in teen pregnancy, and smoking, drinking alcohol and using drugs regularly.²³

Taking into account the patterns of dropout, a main conclusion from our analysis is that both the magnitude of the coefficients and their statistical significance tend to be higher among states categorized as “early dropout” and “dropout in transition,” compared to those categorized as “dropout during USE” and “lower dropout”. The analysis further finds that living in a household with an absent father, having engaged in sexual activity before age 15 and regular use of drugs tend to have a stronger association with dropout when it occurs later in the education cycle (as indicated by the groupings of states). In contrast, smoking cigarettes and drinking alcohol regularly have a stronger association in states categorized as “early dropout” and “dropout in transition”. The associations between dropping out and having been involved in teen pregnancy, and having children, have positive and statistically significant coefficients in all cases, with no discernible pattern between groups of states.

In sum, although we cannot establish the direction or consequences of causality between variables representing social risk situations and behaviors and dropout rates, one can say that there is a close and important relationship that must be taken into account to better understand the reasons for dropout during USE.

Community Factors

Our analysis in the previous sections focused on information about specific individuals (representative of the larger universe in each survey), which may be associated with a set of indicators reflecting their personal characteristics, families, access to services, and prevailing risk behaviors. We turn to a different approach and data source to explore the relationship between community factors and dropout.

²² Note that the estimates presented below refer to USE age of 15-18, while here we refer to the population between 19 and 24 years for which we explore the consequences of dropping out.

²³ It is important to note that the marginal effects shown in the table cannot be interpreted as a causal link, since it is possible that risk behaviors are causing dropout, but it is also possible that dropping out of the education system is the motive for such behavior. Since we do not have further information to determine the directionality, for our purposes we simply conclude that the significant association exists.

Specifically, to expand the data base for analysis and guarantee greater representation of different environments, we add information at the municipal level. In each municipality we calculate municipal dropout rates for youth between age 15 and 18 using micro-data from the 2010 National Population and Housing Census, which specifies for each individual of school age whether or not they attend school. This is then linked to a set of variables that are representative of the conditions prevailing in the same municipality.

A variable of particular interest incorporated in this analysis is the quality of education. In order to provide information on the relation between dropout and perception of quality, we include as an independent variable in our estimates the percentage of students in each municipality that reached a “good” or “excellent” level in the areas of math and language use, measured by the 2013 USE ENLACE test. The argument is that dropout rates of students at the municipal level are influenced by a variety of factors, and they respond to the quality of educational services.

To introduce complementary variables on the municipal context, we further use information from the Statistical Information Bank of INEGI, which contains data on the social, economic and contextual conditions in each municipality. For the characterization of socioeconomic levels we use four measures: the percentage of households benefiting from the *Oportunidades* and Food Aid Programs, the percentage of households with dirt floors, the percentage of communities in the municipality with fewer than 5,000 inhabitants (which is commonly used as a measure of rurality), and the infant mortality rate. These provide information about the number of households in poverty and about their health conditions. To characterize the economic environment, and in particular, the dynamics of the labor market, we include the percentage of the economically active population that is unemployed. We also consider the percentage of households with electricity and running water as a representation of access to public services.

Table 7 presents a summary of our estimates.²⁴ We start with the national sample and estimate the coefficients with robust standard errors. In this case we find that the higher educational quality, as measured by ENLACE, the lower the dropout observed in the Municipality. Although the association is statistically significant, we cannot however interpret this coefficient as evidence of causality—that a cause of dropout is low quality— but as an association with statistical validity that confirms that a relationship exists between the variables, which is independent of the effect of those variables that we used to characterize the social, economic environment, and community services. Therefore, regardless of the direction of causation, the results suggest that addressing the problem of school dropouts in USE will be incomplete without taking into account the quality of education as a central element.

When estimating the model with robust standard errors and by weighted least squares, respectively, we obtain the same conclusion, although in the case of the latter method, the association has a higher level of statistical significance. Also, by separating the sample into groups of states according to their pattern of dropout, a key result is that the association between dropout and quality is negative and significant in all cases, although for the group of states with “lower dropout” the relationship is considerably stronger and more significant.

²⁴ We estimate the model with different econometric methods to inform on various potential biases. To address heteroskedasticity problems commonly found in such regressions we estimate robust standard errors and weighted least squares. We find that the estimated standard errors using robust results generate more efficient estimators, so we use this procedure to corroborate our estimates and if the results are robust to other types of methodological approaches.

Table 7 presents the coefficients of the variables that characterize the socio-economic environment. In this case it is observed that higher percentages of households benefiting from the *Oportunidades* and Food Aid programs are associated with lower school dropout. The result holds for all three types of estimates, and is observed in three of the four categories of states—only in states categorized as “dropout during USE” is a statistically significant relationship not found.

As expected, the coefficient of the association between the share of rural population and the rate of dropout is also positive and statistically significant at the national level, as well as in the “early dropout”, “dropout in transition” and “dropout during USE” groups—the magnitude of the coefficient is higher than the national average in the first two groups. For states categorized as “lower dropout” the relationship is not significant, suggesting again that socioeconomic aspects play an important role as the dropout is earlier, while the quality of education is more relevant when dropout occurs later. The percentage of houses with dirt floors and the infant mortality rate are not significant nationally or for states grouped by their pattern of dropout—the only exception is that the infant mortality rate is significant in states categorized as “dropout during USE” and for “lower dropout” states.

Another interesting result is that the higher the unemployment rate, the higher the dropout rate. In this case the result cannot be interpreted as evidence of causality between variables in a specific direction—it is possible on one hand that higher unemployment increases pressure on youth to leave school to generate income for the household; and on the other, higher dropout may correspond to more youth seeking employment in the same community, which may lead to higher unemployment. The association is maintained in the three estimates, and in the states grouped by pattern of dropout.

We also find nationally that with increased access to electricity and water there is lower dropout. The same is observed in the groups of states, except those with lower dropout, where the effect is not significant.

In sum, these results suggest that in addition to the personal and household characteristics, and the previously documented social risks, community and social contexts in which individuals live are also closely related to retention in education at the typical age of upper secondary attendance. Of particular interest is the association with academic achievement as measured by ENLACE, as this is a factor directly related to educational policy.

3.4 Macro-Aggregate Factors

Finally, the third group of variables that we would expect to have an impact on dropout decisions encompasses those that deal with the environment more broadly, covering not only the community but also the broader context.

To examine these factors we built a database to see if there is an identifiable relationship between dropout levels in each state and elements of the general environment, with an emphasis on the economic conditions that may influence the demand for educational services. Unlike for the analysis of community factors, we include observations over time to form a balanced panel that includes the 32 states of the country over a span of 22 years between 1990 and 2012.

One factor of particular interest at this level, and that has not been explored yet in our analysis, is the influence of the returns to education on dropout. Since one of the purposes of schooling is to generate

better income opportunities, it would be expected that with greater returns to education there would be a higher opportunity cost of dropping out, and therefore, fewer youth would exit the education system before graduating from USE. Although our focus is on USE, in addition to verifying the relationship with the returns to this level, it is also of interest to identify the relationship with the returns to higher education because USE is a prelude to this educational level. With greater returns to HE, we would expect fewer dropouts at the USE level.

To estimate the returns to education we examine data from the series of National Occupation and Employment Surveys (ENOE) through a basic Mincer type equation controlling for selection bias for the period 1990-2012 for each state. We link the panel of data to the state dropout rate in USE, which we define as the dependent variable.

As in the previous analysis, the selection of additional information is a function of the availability of state-level data for a sufficient period of time. The Information Bank of INEGI includes state data for some variables including the state's Gross Domestic Product (GDP) which can be used to control for the level of overall development of the state, the rate of employment in the informal sector (which is presumably a reflection of employment conditions that prevail locally), and the female labor market participation rate, which is a good indicator of the opportunities that are accessible to women. Additionally, in order to incorporate information on the supply of USE educational services, we calculate the number of teachers per USE campus from the 2012 SEP data.

Fixed and random effects methods were used for panel estimation, and in all cases the Hausmann test indicates that the fixed effects model is more consistent and is preferred, so these are the only ones we presented here. So, although the number of independent variables considered is small, the results control for time invariant state characteristics.

The results for the national sample and for the four categories of states are presented in Table 8. The first set of coefficients quantifies the strength of the association between USE dropout at the state level and returns to education. We find that the relationship between the returns to secondary education, USE, and higher education and dropouts are negative—that is, the higher the returns, the lower the dropout rates. This is consistent with the hypothesis that the returns increase the cost of leaving the educational system.

We find some additional interesting differences. The first is that at the national level, and for states categorized as “dropout during USE” and “lower dropout”, the magnitude of the effects for higher education are greater than for USE and secondary, which suggests that the role of USE as a platform for access to higher education is more important in these cases. In states categorized as “early dropout” and “dropout during transition”, USE returns play a greater role. However, as in previous cases, we interpret the coefficients only as associations between variables because the returns on the one hand can determine the decision to stay or not in the education system, but on the other, they are also determined by the supply of human resources, which is a function of school attendance.

Two other consistent results are that the state dropout rate is inversely related to income levels—in states with a higher GDP per capita there is less dropout—and is directly related to the rate of informal employment—with more informality there is more dropout. One interpretation of the latter result is that if the labor market does not offer employment opportunities with benefits and other desirable elements, there are fewer incentives to continue to invest in education and finish USE. The

only case that deviates from these patterns is that for states characterized as “early dropout” the coefficient for formal employment is not statistically significant.

The results for female participation and the number of teachers per school vary more, with substantial significant effects only identified in the case of states categorized as “dropout during USE” and “lower dropout”. At the national level, the relationship with the number of teachers is also significant.

4. Public Policies to Tackle School Dropout in USE

Given the complexity of the dynamics of dropouts in USE, it is clear that a country like Mexico requires a multiplicity of interventions implemented to varying degrees in different contexts. In this sense, one of the central results of this study with direct implications for public policy is the dropout pattern classification. In states where dropout is early (at the secondary level), to increase coverage of USE, it is necessary first to increase levels of retention in basic education so that a greater proportion of youth complete secondary. In cases where dropout is primarily in transition (between secondary and USE), a gradual increase in the rate of completion of secondary has allowed expansion of coverage in USE, but it is necessary to accelerate the process of attracting students to USE from secondary school to increase retention in the system. In the case of states in which dropout is primarily during USE, the main challenge is to keep youth in education, including offering incentives for completion of this level.

Table 9 summarizes the main results obtained from our estimates and can be used to guide the discussion on specific priorities. On the vertical axis are variables for which we have managed to build a statistical representation related with dropout at the personal, family, community, and macro levels. On the horizontal axis are groups of states according to their patterns of dropout (early, in transition, during, and lower). In each cell of the matrix we include an indicator of the intensity of the general association identified by our statistical analyses.

According to our results, in general, the personal factors that have a close association with dropout are belonging to an indigenous group and being located in rural areas. These elements are particularly important in states categorized as “early dropout” and “dropout in transition”. One implication would be prioritizing interventions that adapt schooling to indigenous cultures and language. A similar picture, although with less intensity, is presented for individuals who live in a household with an absent father or head of household unemployed.

As for other household conditions, we find that income, the value of assets, and access to basic housing services are more closely related to dropout in groups of states where dropping out occurs more prematurely. In this area Mexico has already initiated efforts that are expected to generate lower dropout rates in general and especially in cases where dropout occurs at an earlier stage. The most representative case is the *Oportunidades* conditional cash transfer program, implemented in the country since 1998 and expanded to USE in the year 2004. This program has already demonstrated its positive and significant effects on low income groups who are attending primary and secondary, and although there is no impact assessment of its effects on USE, its effects would be expected to be similar. Recently it has been supplemented by the USE Scholarship Program, which offers financial support to households that are not in the *Oportunidades* Program, but there is no evidence as yet of the new program’s effects.

Among community factors, social risks such as early pregnancy, early childbearing and exposure to addictions, tend to have a closer relationship as dropout is premature. In 2008, Mexico started the *ConstruyeT* program, which is specifically aimed at reducing risks in schools but according to our results it is still necessary to structure such policies from secondary education to influence the spaces where social risks cause greater vulnerability.

An important conclusion of our analysis is the association between educational quality and school dropouts, which seems to be closest in states with dropout during USE and those with the lowest dropout. In this respect, in 2008, Mexico initiated the Comprehensive Reform of Upper Secondary Education which aims precisely at increasing the quality and relevance of USE. The Reform effectively started its implementation in 2012 with the first schools being certified in the new model, so it is still early to assess its effects.

Finally, the analysis at the aggregate level suggests that the returns to education also play an important role in decisions to remain in the education system. The association with the returns to higher education is especially relevant in cases where most dropout occurs later. One implication is that interventions that provide information to youth on the economic benefits of continuing in education can be important for preventing dropout.

International experience and literature on strategies to reduce dropout also highlight a range of interventions which target the various causes and sources of dropout. Appendix Table A1 provides an overview of some international examples that are relevant for addressing the different patterns of dropout discussed above.²⁵ In particular, strategies such as those in the United States, Australia and Canada, have had success supporting at-risk youth through targeted attention to support educational attendance. In addition, various curricular strategies, such as those in the US, Europe, Canada and Chile, have incentivized retention by exposing youth to higher education, involving secondary students in USE, and providing linkages to the workplace. Strategies targeting the management of schools, such as school level action plan in Chile and the involvement of the school community in Spain, have also shown promising results.

Drawing from these experiences, and in line with the differentiated analysis of dropout patterns and causes, different types of instruments would seem more relevant in different cases. For instance, to address dropout that occurs during the *transition* from secondary to USE, as shown in Appendix Table A1, strategies such as personalized and targeted monitoring of at-risk secondary students offering academic and socio-emotional support to detect and address risks before they manifest in school dropout, involvement of the immediate community and parents as a network of protection of youth, assigning tutors and mentors that offer support in and outside of school, and including employment orientation for those who need to combine work and study, have generated evidence of positive impacts.

Similarly, to address drop out which occurs *during* USE, other types of interventions would seem more relevant, such as establishing personalized goals and work plans to increase academic achievement of students at risk, providing individual monitoring with family involvement to prevent dropout, supporting at-risk students to prevent dropout through informational sessions and concrete actions in school, curricular enhancements to improve education quality and relevance, and early

²⁵ Note that financial strategies such as the Conditional Cash Transfer *Bolsa Familia* and Colombia's *Familias en Acción* are not included here as Mexico is already advanced in this approach with the *Oportunidades* program

exposure to higher education to incentivize retention and provide information on yields of higher education.

5. Conclusions

The objectives of this study are to characterize the phenomenon of dropout in Mexico, understand its implications, and identify to the extent possible, its causes.

The study finds that, although dropout is a generalized problem that has become a bottleneck for the educational progress of the country, at least four different patterns can be identified. The first categorized as “early dropout” includes states where a reduced proportion of youth are reaching upper secondary age (15 to 18) with sufficient academic requirements to enter USE. The second, called “dropout in transition”, includes states in which the biggest drop in enrollment is observed in the transit between secondary and USE. The third, called “dropout during USE” considers cases with high absorption at USE level, but with exits from the education system on a larger scale for this level. The fourth group consists of five states with lower levels of dropout.

According to our results, the consequences of dropping out are many, ranging from the most apparent, which is the inability to pursue higher education (which has the highest economic returns) to reduced opportunities for securing employment, access to lower wages, and higher levels of informality. One dimension explored is that the prevalence of social risks observed when individuals are between 19 and 24 years, including early pregnancy, having children early, and the propensity to addiction, are higher among youth who dropped out of USE between ages 15 and 18. These types of social risks can have long-term effects with multiple impacts, including inter – generational effects.

As for explanations, we combine different databases and statistical methods ranging from the use of surveys with information on specific individuals, to data aggregated at the municipal and state-level to explore the importance of the relationship between dropout rates and family, personal and economic factors, community and social factors, and macro aggregated factors.

Our central conclusion in this regard is that not only are multiple dropout patterns found, but there are also multiple elements, which intersect with the various patterns to form a complex and multifaceted panorama. This implies that addressing the problem requires different policy instruments, different approaches, and especially a perspective that is not limited to USE, which is where the problem occurs, but even at early ages where the phenomenon appears to have important roots.

As to specific priorities, we find that personal, family, and household economic factors, and the prevalence of social risks have a closer association with dropout as dropout is earlier. However, the association between dropout and factors such as education quality has greater intensity in states categorized as “dropout during USE” and with the lowest USE dropout rates. We also find that as the returns to education grow, dropout is lower. In the case of returns to higher education, the association with dropout is stronger for states that have the highest dropout during USE.

Finally, although Mexico has made some recent efforts to address the phenomenon of USE dropout with structured and innovative policies, it is necessary to strengthen existing instruments and shape policy in a broader sense in order to meet the diversity of the phenomenon in the following years.

References

- Alfonso, M., M.S. Bos, J. Duarte, y C. Rondón, “Panorama General de la Educación en América Latina y el Caribe”, Capítulo 1 en M. Cabrol y M. Székely, “Educación para la Transformación”, Banco Interamericano de Desarrollo, 2013.
- Arredondo, A., “Entre la Primaria y la Universidad; la educación de la juventud en la historia de México”, Santillana, México DF, 2008.
- Castañón, R., y R.M. Seco, “La Educación Media Superior en México” Noriega Editores, México DF., 2000.
- Cunningham, W., L. Cohan, S. Naudeau, y L. McGinnis, “Supporting Youth at Risk: A Policy Toolkit for Middle-Income Countries” The World Bank, Washington DC, 2008.
- Cunningham, W., L. McGinnis, R. García-Verdú, C. Tesliuc y D. Verner, “Youth at Risk in Latin America and the Caribbean” The World Bank, Washington DC, 2008.
- Didou, S., Martínez, S., “Evaluación de las Políticas de Educación Media Superior y Superior en el sector tecnológico federal”, Subsecretaría de Educación e Investigación Tecnológicas, Secretaría de Educación Pública, México, 2000.
- Duryea, S., A.C. Edwards,, and M. Ureta, eds, “Critical Decisions at a Critical Age: Adolescents and Young Adults in Latin America”, Inter American Development Bank, Washington DC, 2003.
- Fiszbein, A. and N. Schady “Conditional Cash Transfers: reducing present and future poverty” World Bank, Washington DC, 2009.
- Friedman, J. y J. Levinsohn . The Distributional Impacts of Indonesia's Financial Crisis on Household Welfare: A “Rapid Response” Methodology. The World Bank Economic Review, Volume 16, Number 3 December, pp. 397-423, 2002.
- Hanushek, E., y L. Woessmann, “The Role of School Improvement in Economic Development”, *CEifo Working Paper* No. 1911, Febrero, 2007.
- Kane, June, “What the Economic Crisis Means for Child Labor” *Global Social Policy*, vol 9 (supp), pp 175-196.
- Mehrotra, Santosh, “The Impact of the Economic Crisis on the Informal Sector and Poverty in East Asia” *Global Social Policy*, vol 9 (supp), pp 101/118
- Mendoza, Ronald, “Aggregate Shocks, Poor Households and Children: Transmission Channels and Policy Responses” *Global Social Policy*, vol 9 (supp), pp 55-78.
- OECD, “*The High Cost of Low Education Performance*”, Organization for Economic Co-Operation and Development, Paris, 2010.
- Patel, Mahesh, “Economic Crisis and Children: An Overview for East Asia and the Pacific”, *Global Social Policy*, vol 9 (supp), pp 33-54.

Ramesh, M., “Economic Crisis and its Social Impacts: Lessons from the 1997 Asian Economic Crisis”, *Global Social Policy*, vol 9 (supp), pp 79-99.

Rao Singh, Anapama, Petel, M., Heyzer, N, Miyegombo, E., Kohler, G., Toole, D., Chhibber, A., and Patel, M. “Global Social Policy Forum: Children and the Economic Crisis” *Global Social Policy*, vol 9 (supp), pp 5-31.

Secretaría de Educación Pública, “Sistema Educativo de los Estados Unidos Mexicanos: Principales Cifras Ciclo Escolar 2011-2012”, Secretaría de Educación Pública, México DF, 2012 http://www.sep.gob.mx/work/models/sep1/Resource/1899/2/images/principales_cifras_2011_2012.pdf).

Secretaría de Educación Pública, “Sistema Nacional de Información Educativa”, Secretaría de Educación Pública, México DF, 2012a. Puede accederse de manera electrónica en: (http://www.snie.sep.gob.mx/indicadores_y_pronosticos.html).

SEP-COPEEMS, “Reporte de la Encuesta Nacional de Deserción en la Educación Media Superior”, Subsecretaría de Educación Media Superior, México DF, 2012.

Shang, Xiaoyuan, y Wu, X. “Protecting Children under Financial Constraints: ‘Foster Mother Villages’ in Datong. *Journal of Social Policy*, Volume 32, Number 4 (October 2003), pp. 549-570.

Solana, F., Raúl. C. Reyes y Raúl Bolaños, “Historia de la Educación Pública en México”, Fondo de Cultura Económica, México, 2000.

Spinks, S., “Adolescent Brains are Work in Progress”, PBS Frontline, 2003.

UNESCO, “*Education in and for the Information Society*”, United Nations Educational, Scientific and Cultural Organization, Paris, 2003.

Zorrilla, J.F., “El Bachillerato Mexicano: un sistema académicamente precario”, Instituto de Investigaciones sobre la Universidad y la Educación, Universidad Nacional Autónoma de México, México DF, 2008.

Zorrilla, J.F., T. Bracho, F. Miranda y F. Martínez., “La Educación Media Superior en México; balance y perspectivas”, Secretaría de Educación Pública, México, 2012.

Figure 1: Evolution of the rate of coverage by education level in Mexico 1990-2012

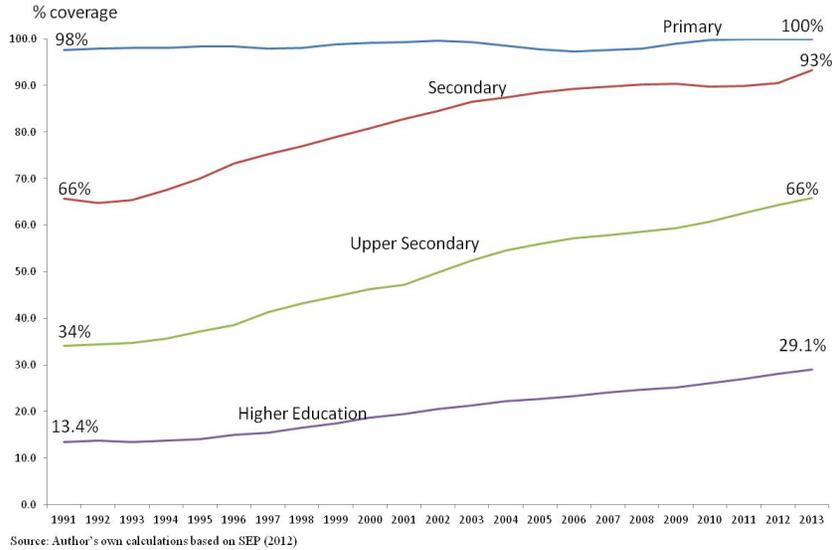


Figure 2: Evolution of the net coverage rate in USE 1984-2012

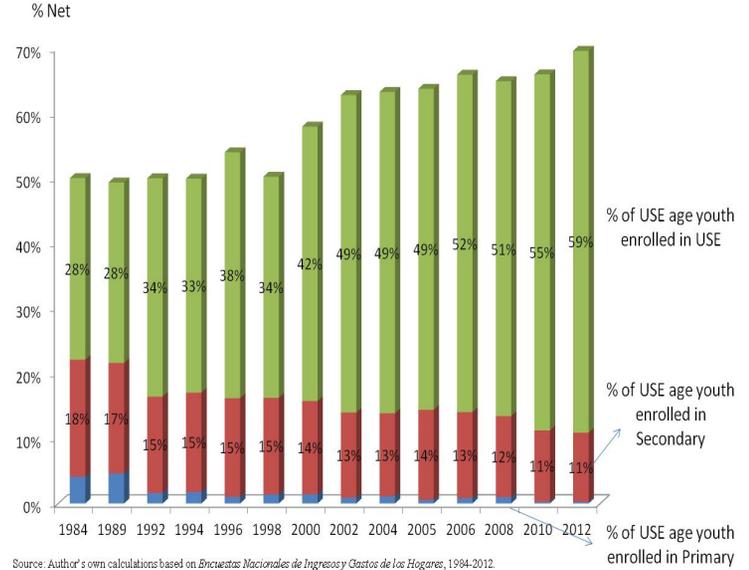


Figure 3: Evolution of the rate of absorption by education level in Mexico 1990-2012

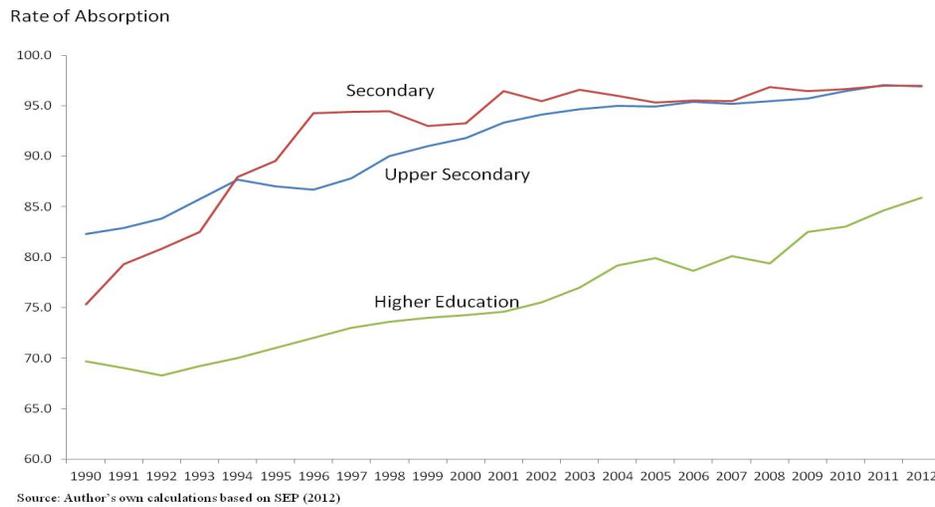


Figure 4: Evolution of the rate of dropout by education level in Mexico 1990-2012

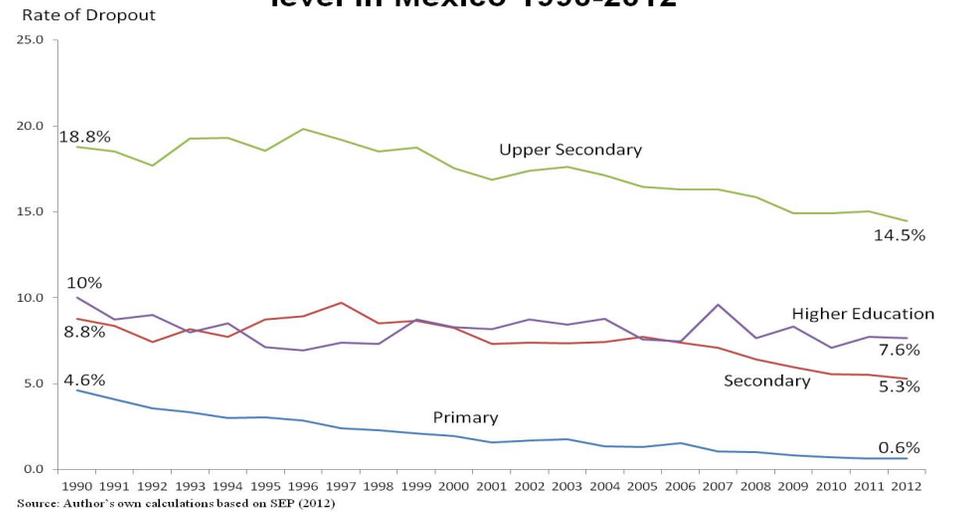


Figure 5: Average school trajectory from Primary to Higher Education in Mexico and the state of Oaxaca

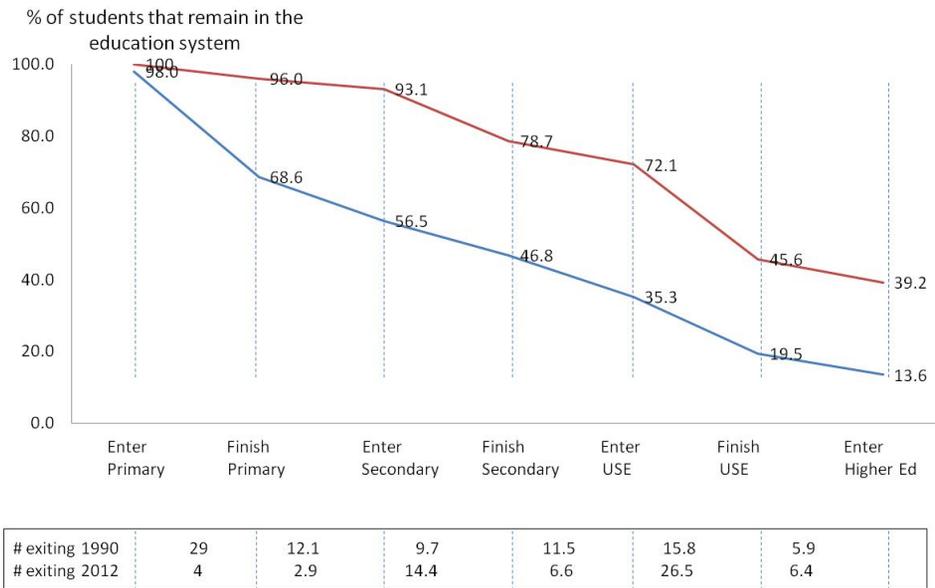


Figure 6: Average school trajectory from Primary to Higher Education in Mexico and the state of Oaxaca

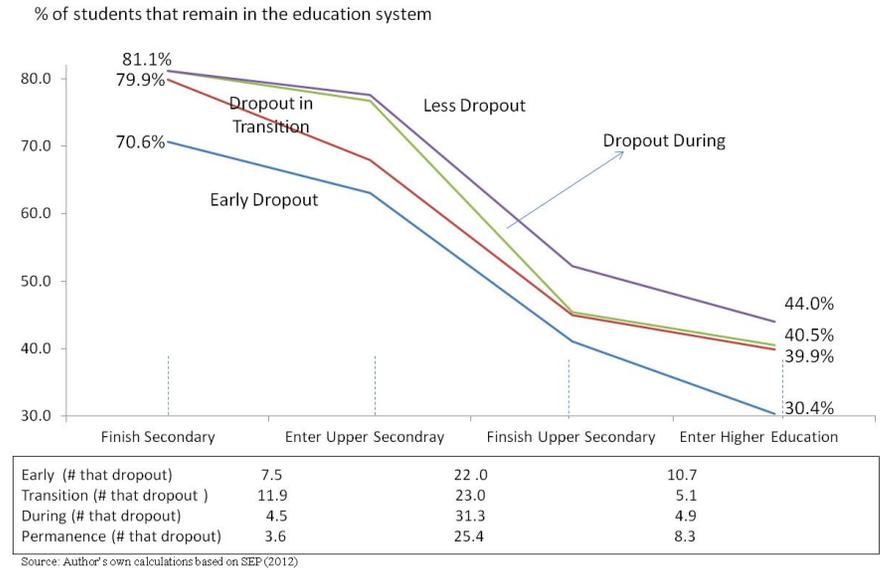
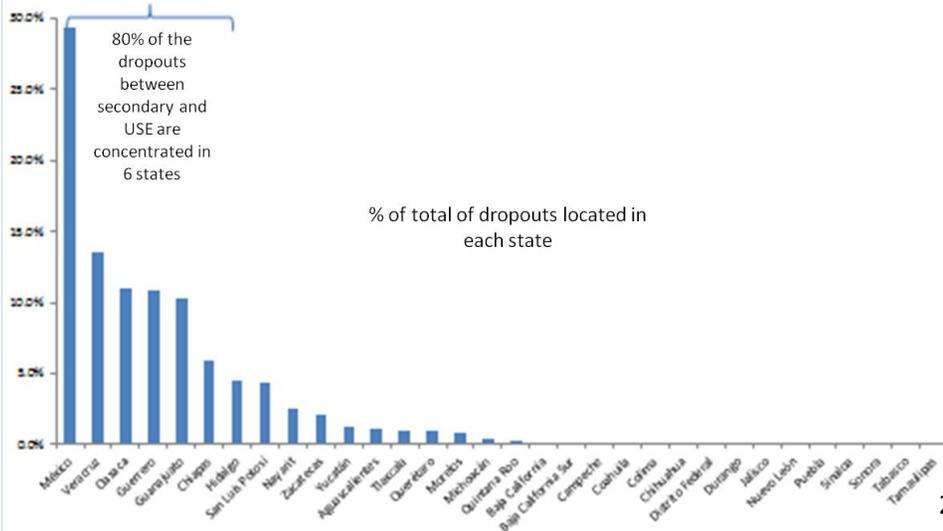
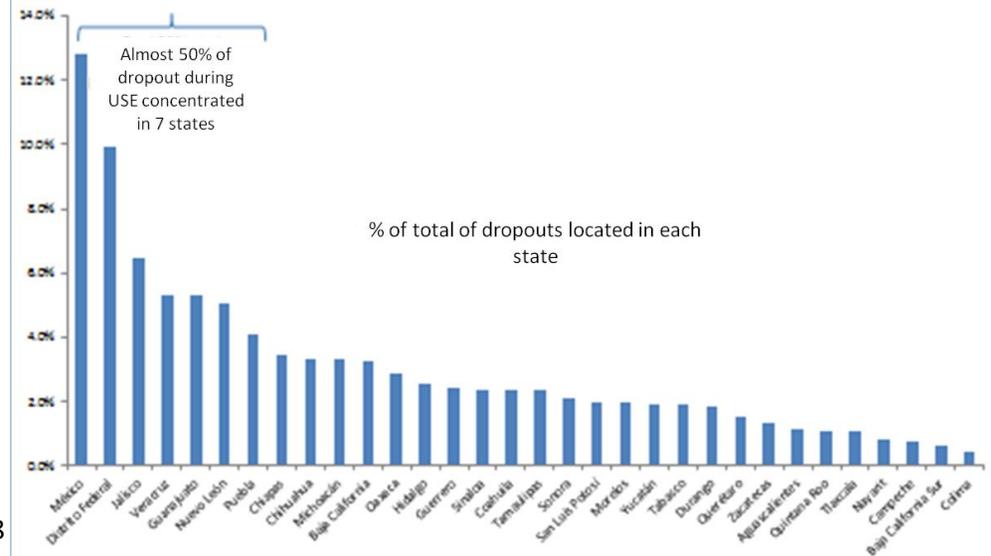


Figure 7: Distribution of the student population that drops out between Secondary and USE by state, 2011-2012



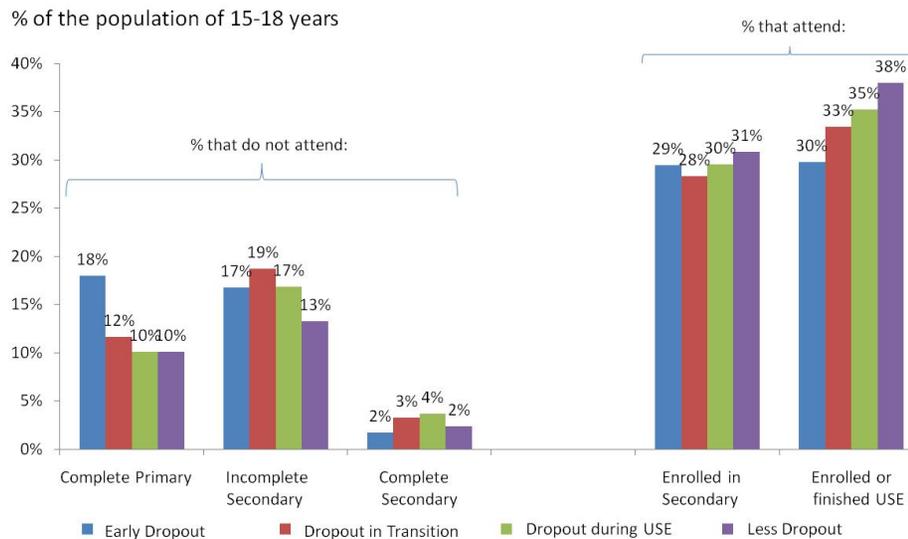
Source: Author's own calculations based on SEP (2012)

Figure 8: Distribution of the student population that drops out during USE by state, 2011-2012



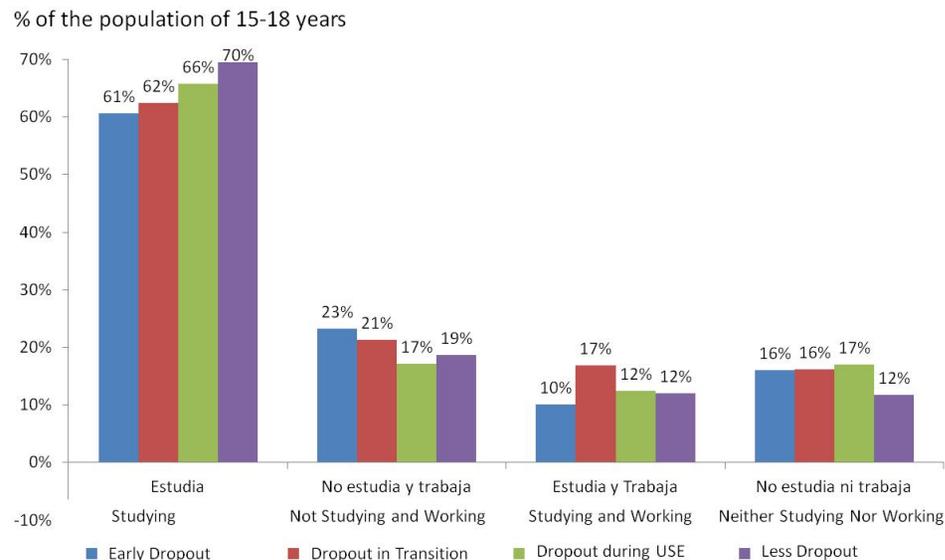
Source: Author's own calculations based on SEP (2012)

Figure 9: Educational Profile of the USE age population in Mexico in 2012 by pattern of dropout



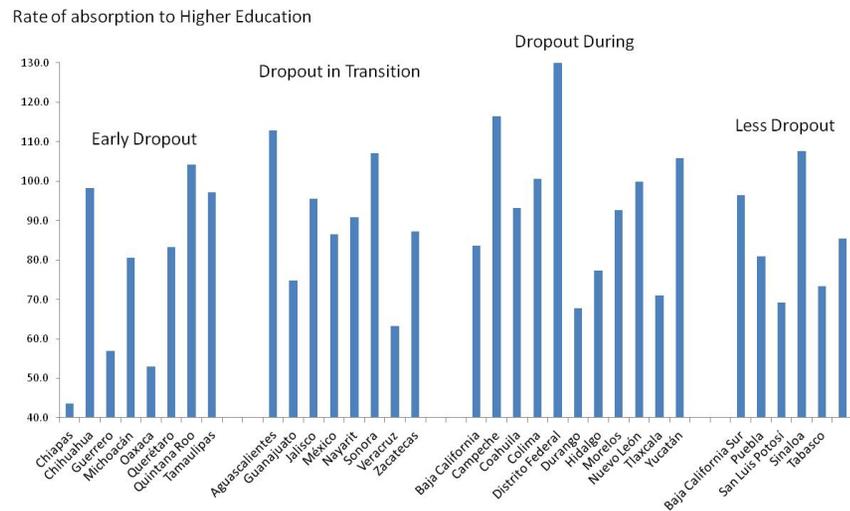
Fuente: Author's own calculations from the Encuesta Nacional de Ingresos y Gastos de los Hogares 2012, INEGI.

Figure 10: Use of time of the USE age population in Mexico in 2012 by pattern of dropout



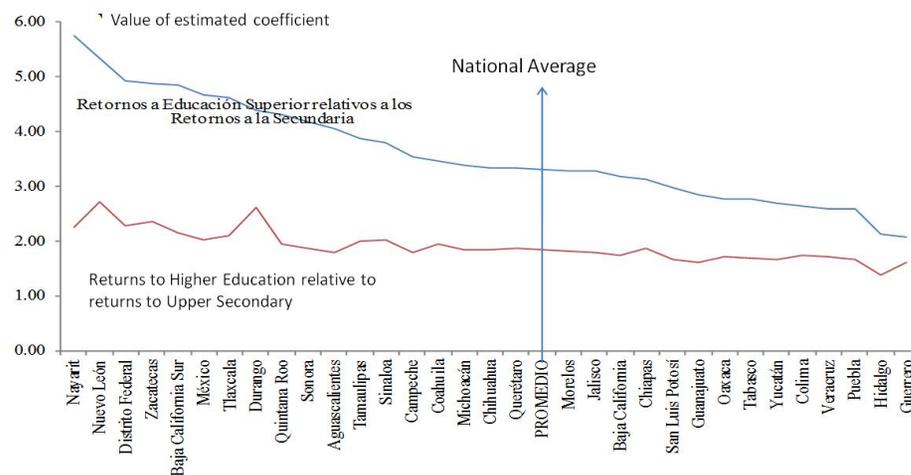
Source: Author's own calculations from the Encuesta Nacional de Ingresos y Gastos de los Hogares 2012, INEGI.

Figure 11: Rate of absorption in Higher Education by groups of states, 1990-2012



Source: Author's own calculations based on SEP (2012)

Figure 12: Relative returns to Higher Education by state in México, 2010



Source: Author's own calculations based on ENOE (1012).

Figure 13: Returns to complete USE relative to the returns to incomplete USE by state, 2012

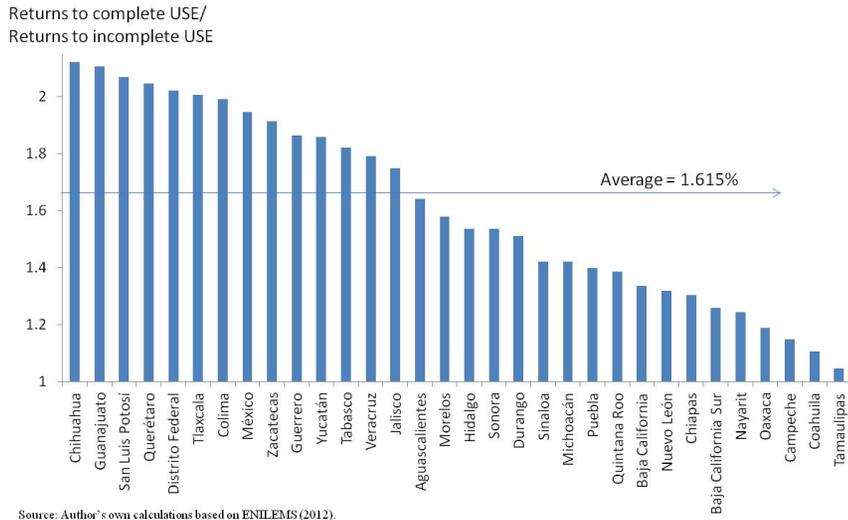


Figure 14: Estimated probability of dropout from USE associated with personal and family characteristics 1984-2012

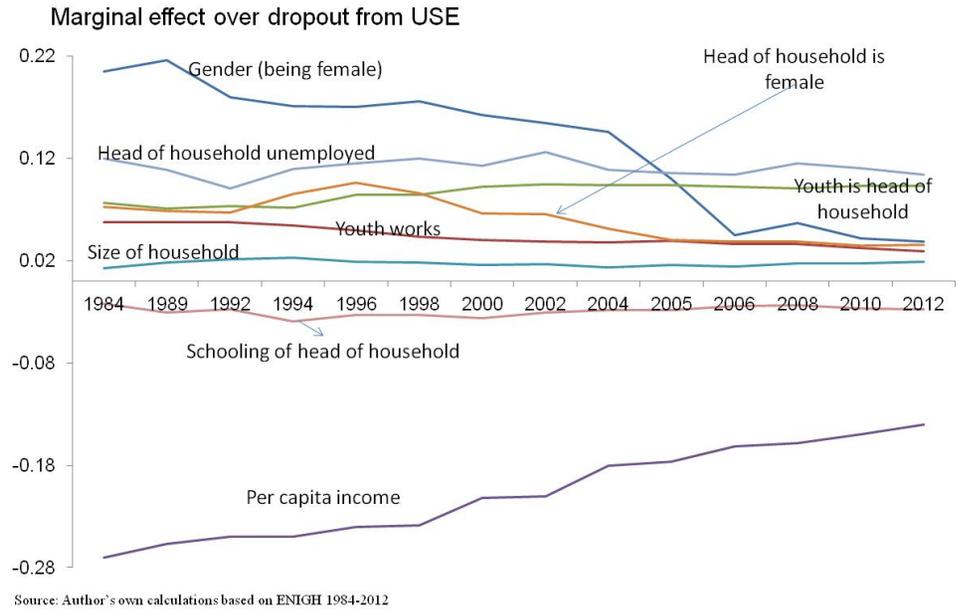


Figure 15: Estimated probability of dropout from USE associated with personal and family characteristics by group of states in 2012

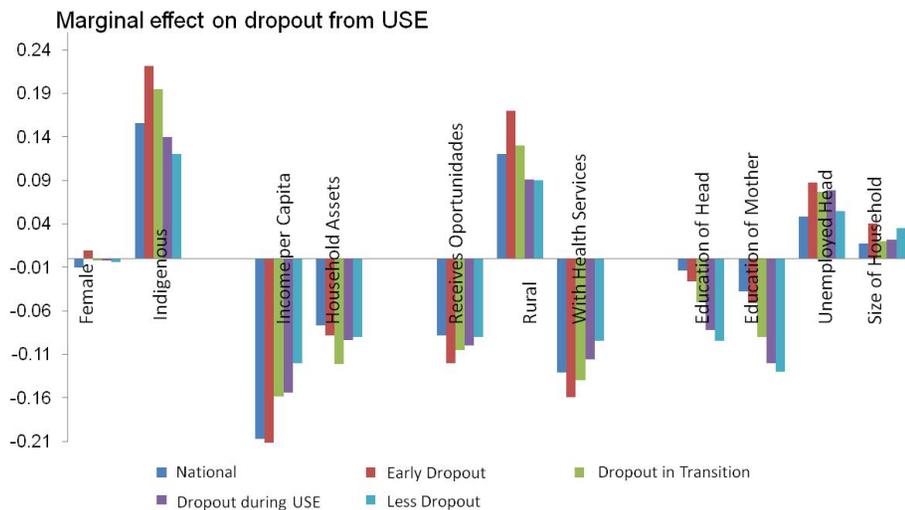


Figure 16: Proportion of students in insufficient level in the ENLACE 3° Secundaria test 2013

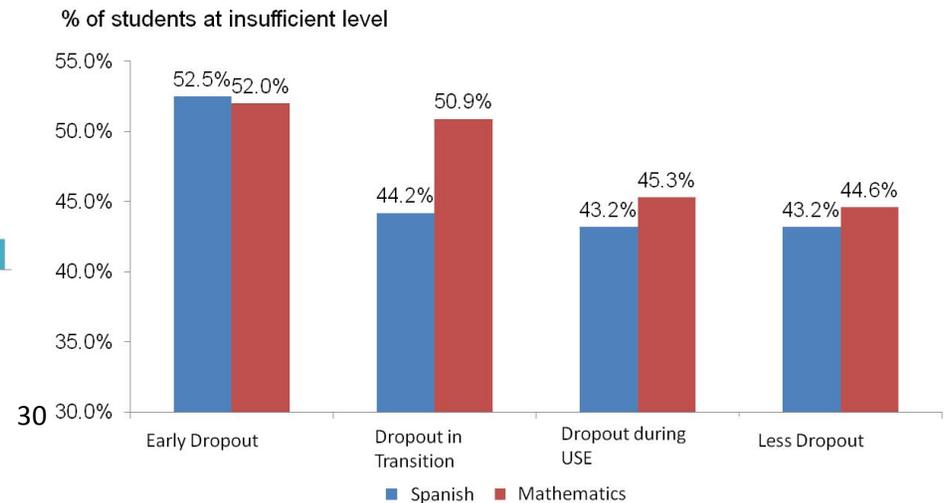
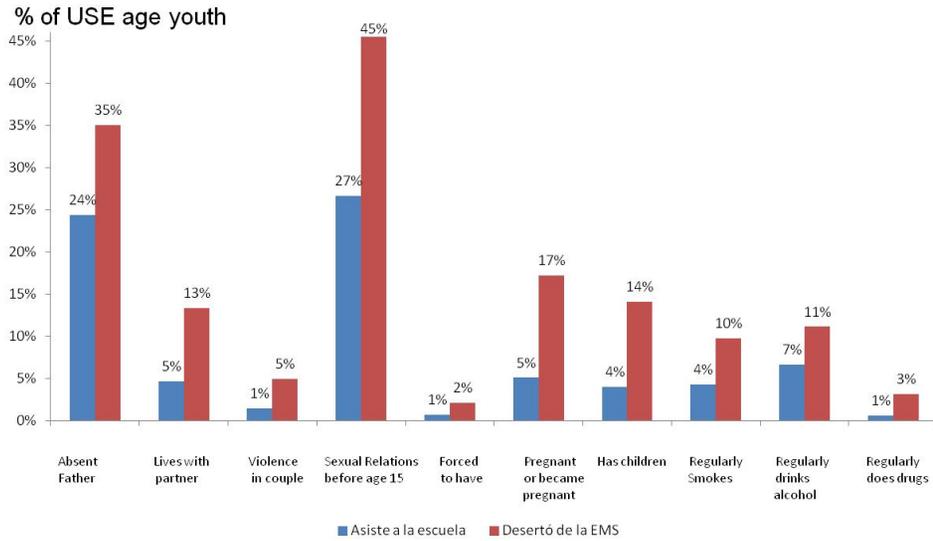
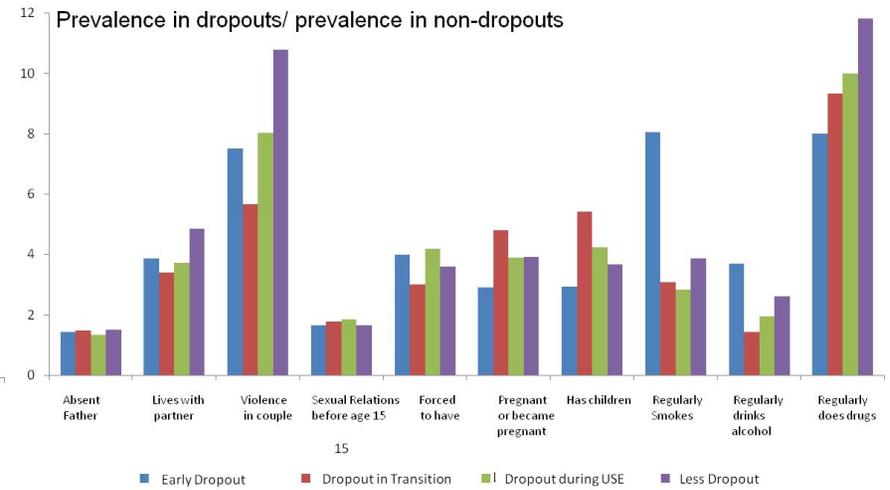


Figure 17: Prevalence of risks and addictions in USE age youth in Mexico in 2010



Source: Author's own calculations based on the *Encuesta Nacional de Juventud 2010*.

Figure 18: Differential of prevalence of risks and addictions between youth who attend USE and dropouts in 2010 by groups of states



Source: Author's own calculations based on the *Encuesta Nacional de Juventud 2010*.

Table 1

USE Education Indicators by State, 2012					
Group	State	% Coverage Secondary	% Absorption	% Dropout	% Coverage USE
Early Dropout	Chiapas	83.3	98.0	12.4	65.0
	Chihuahua	91.4	117.5	18.4	66.8
	Guerrero	86.8	85.5	13.7	54.7
	Michoacán	87.2	102.2	11.0	58.2
	Oaxaca	90.6	85.5	13.4	57.2
	Querétaro	94.3	101.0	13.7	61.9
	Quintana Roo	86.9	98.9	13.0	65.7
	Tamaulipas	90.9	110.0	12.3	65.5
	Average	88.9	99.8	13.5	61.9
Dropout in Transition	Aguascalientes	95.0	90.7	14.6	63.8
	Guanajuato	91.3	92.7	16.4	53.8
	Jalisco	92.1	94.6	12.2	61.2
	Mexico	93.4	92.6	16.1	60.1
	Nayarit	92.1	97.3	8.2	69.2
	Sonora	96.0	97.6	11.6	71.2
	Veracruz	91.2	88.9	11.5	61.4
	Zacatecas	93.8	89.4	13.2	62.0
	Average	93.1	93.0	13.0	62.8
Dropout During USE	Baja California	94.8	110.2	12.4	69.0
	Campeche	90.7	104.3	14.9	64.2
	Coahuila	93.0	110.6	17.2	62.7
	Colima	86.2	111.9	14.5	68.5
	Federal District	114.8	133.4	19.9	102.7
	Durango	91.7	117.3	16.6	72.6
	Hidalgo	98.5	94.8	14.0	70.5
	Morelos	94.9	102.0	18.3	69.1
	Nuevo León	97.8	110.0	18.2	62.0
	Tlaxcala	95.1	96.6	14.4	72.0
	Yucatán	91.8	98.3	17.2	64.6
Average	95.4	108.1	16.1	70.7	
Less Dropout	Baja California Sur	90.0	100.6	10.0	72.8
	Puebla	90.2	106.8	11.0	69.0
	San Luis Potosi	93.9	94.8	13.2	61.7
	Sinaloa	92.3	106.6	12.9	76.8
	Tabasco	97.1	102.7	11.8	73.1
	Average	92.7	102.3	11.8	70.7
National	93.3	100.9	14.5	65.9	

Source: Calculated from SEP (2012).

Table 2

Differences in labor market variables between
Complete and incomplete USE

State	PEA		Formal	Employment
	Incomplete USE	Complete USE	Incomplete USE	Complete US
Aguascalientes	37.2%	63.0%	43.2%	55.2%
Baja California	43.5%	64.8%	49.1%	56.0%
Baja California Sur	47.6%	72.5%	44.5%	59.0%
Campeche	47.5%	68.0%	21.6%	48.1%
Coahuila	55.3%	65.1%	57.2%	60.2%
Colima	57.1%	70.0%	37.4%	51.1%
Chiapas	33.2%	64.8%	10.9%	34.9%
Chihuahua	34.7%	63.0%	66.1%	69.9%
Federal District	50.5%	63.6%	44.1%	52.8%
Durango	45.6%	64.2%	41.9%	47.3%
Guanajuato	45.8%	72.5%	32.7%	50.9%
Guerrero	42.6%	64.7%	12.0%	31.8%
Hidalgo	36.1%	63.9%	23.7%	39.1%
Jalisco	43.9%	67.5%	35.6%	49.4%
Mexico	43.4%	63.2%	35.2%	50.7%
Michoacán	49.3%	69.6%	16.6%	42.3%
Morelos	39.5%	65.3%	19.8%	44.9%
Nayarit	51.8%	66.6%	24.0%	39.5%
Nuevo León	58.6%	65.0%	55.6%	63.6%
Oaxaca	39.9%	69.1%	13.5%	36.2%
Puebla	38.8%	62.6%	23.4%	35.5%
Querétaro	32.6%	64.1%	44.0%	57.4%
Quintana Roo	49.3%	74.5%	41.1%	61.0%
San Luis Potosi	48.8%	66.8%	43.3%	53.3%
Sinaloa	51.8%	65.3%	34.0%	47.7%
Sonora	48.5%	63.7%	47.6%	62.0%
Tabasco	38.4%	64.5%	26.5%	46.4%
Tamaulipas	49.1%	65.0%	46.6%	61.9%
Tlaxcala	36.6%	65.1%	16.6%	35.9%
Veracruz	35.6%	60.2%	25.0%	36.2%
Yucatán	43.0%	67.3%	26.1%	49.0%
Zacatecas	45.6%	62.8%	21.8%	43.1%
National	45.4%	65.0%	37.4%	49.4%

Source: Calculated from 2012 ENILEMS

Table 3

Association between Risk Behavior and Dropout in youth aged 19 to 24 years in Mexico, 2010

Independent Variable	Independent Variable					
	Has suffered violence in couples	Has been forced to have sex	Got pregnant before 18 years	Smoke cigarettes regularly	Drinks alcohol regularly	Consumes drugs regularly
Dropped out before completing USE	-0.052	0.011 *	0.059 *	0.027 *	0.029 *	0.009 **
Age	0.001	0.002	0.031 ***	0.005 *	0.007 **	-0.001
Sex	0.004	-0.013 **	-0.124 ***	0.101 ***	0.135 ***	0.007 **
Married or cohabiting	-0.015	0.001	0.343 ***	-0.066 *	-0.034	-0.009
Lives with partner	0.000	-0.001	0.438 ***	0.077 **	0.034	0.009
Medical Service	0.038	-0.005	0.059 **	-0.035 **	-0.033 **	-0.004 *
<i>Oportunidades</i> Scholarship	0.127	0.001	-0.032	0.000	-0.055	0.000
Size of household	0.010	-0.000	0.069 ***	0.003	0.000	0.000
Rural	-0.059	-0.013 **	-0.059 **	-0.023	-0.015	-0.004
Index of assets	-0.015	-0.004 **	-0.036 ***	0.018 ***	0.027 ***	0.001
Educ boss	-0.008	0.001	-0.008	-0.000	0.006	0.000
Educ of spouse	0.004	-0.001	0.001	0.002	-0.003	-0.000
Head speaks indigenous language	-0.015	-0.002	-0.175 ***	-0.036	-0.041	-0.007
Head is employed	0.064	-0.013	0.010	0.008	-0.007	-0.000
Absent parent	0.012	0.005	0.096 ***	0.029 *	0.027	0.000

Source: Own calculations. The estimates reported represent the average margins evaluated.

*, **, And *** represent statistically significant at 10%, 5% and 1%, respectively.

Table 4

Main cause of dropout identified by region (% of respondents who cited the cause as first mention)

Reasons for Dropout	Similar to the national pattern					Economic Cause		School Cause			School and Personal				
	National	Northeast and Peninsula	North Central	Northeast Central	East Central	South	*	West	South East	Metro- politan	Central	Eastern Gulf			
Economic Causes	36.4	36.9	40.9	38.0	35.2	41.9	*	30.1	*	37.0	34.2	38.4	32.6		
Lack of money in household or lack of money for needs, tickets or registration	36.4	36.9	40.9	38.0	35.2	41.9	*	30.1	*	37.0	34.2	38.4	32.6		
School-educational causes	29.5	26.1	29.0	31.0	34.0	21.3	*	41.9	*	35.3	*	38.9	*	44.4	*
You had trouble understanding teachers	3.2	2.0	1.7	2.2	2.5	4.0		4.5	4.1	3.1	2.1	6.2			
There were rules of discipline with which you did not agree	1.0	0.4	0.5	0.4	1.0	0.7		1.9	0.2	1.0	1.2	0.8			
The school was far from you	1.4	2.4	0.5	1.2	1.5	1.8		1.8	1.5	1.0	2.8	2.0			
You disliked studying	7.8	5.3	3.7	15.4	9.7	5.2		9.5	8.3	7.0	8.9	7.4			
There were classmates who hassled you	1.1	0.3	0.4	1.6	1.9	0.5		2.6	1.5	1.2	0.6	0.9			
You were assigned to a different shift than you wanted	3.4	2.7	4.1	4.1	0.6	1.1		7.4	6.8	2.9	1.4	6.0			
You felt discriminated against for the way you think or dress	0.6	0.3	1.4	0.9	1.2	0.9		0.7	1.0	0.8	1.5	5.8	*		
You were discharged for failing grades	7.2	7.9	8.5	1.5	5.5	4.4	*	8.3	5.7	10.5	11.2	4.0			
You considered that it was of little use to study	0.6	3.0	2.9	1.0	3.3	0.4		0.8	2.0	7.0	7.0	6.7	*		
You disliked the school facilities	0.7	0.4	0.4	0.4	2.0	0.4		0.6	2.0	0.9	0.3	2.3			
You wanted to change schools but your courses were not revalidated	0.4	0.0	0.4	0.4	1.0	0.5		1.0	1.0	0.2	0.3	0.9			
You were expelled from school for disciplinary reasons	1.7	1.2	3.1	0.9	3.3	1.4		2.3	0.4	2.5	0.3	0.9			
You felt insecure at school or on the way to it	0.4	0.3	1.4	1.1	0.5	0.0		0.5	0.8	0.8	0.9	0.4			
Personal reasons	23.1	27.5	27.0	22.0	24.9	19.4		21.2	22.7	20.9	17.9	*	18.4	*	
You consider work more important than to study	4.7	2.1	4.1	4.9	1.6	5.0		4.3	1.5	4.6	1.0	0.8			
You changed homes	0.9	0.8	0.4	0.5	0.5	0.0		1.4	1.2	0.2	0.7	0.9			
You had personal problems with your mom, dad or their partners	1.8	2.1	0.5	1.7	2.3	1.4		1.8	1.2	0.7	1.8	0.8			
You married	6.0	8.3	1.7	3.0	12.1	8.0		6.5	6.8	6.2	3.7	4.5			
Your family preferred other siblings to study	0.5	1.1	0.5	2.0	0.7	1.4		1.5	0.5	0.2	1.2	0.9			
A relative died, or someone in your family (including you) is seriously ill	1.7	2.3	0.4	2.0	1.0	1.8		1.2	2.0	2.3	1.5	1.5			
You got pregnant, got somebody pregnant or had a child	7.1	10.1	17.0	6.2	5.5	1.8	*	3.8	9.0	6.3	7.7	8.0			
You had low self-esteem	0.4	0.7	2.4	1.7	1.1	0.0		0.6	0.5	0.4	0.3	1.0			
Another	1.1	1.4	0.7	0.8		0.4		4.0	1.2	1.2	2.5	2.0			

Source: Author's calculations from the National Survey Dropout of School Education, SEP, 2011.

* Statistically significant difference from the national average

Table 5

Causes of Dropout reported by Youth 15-18 years outside of the education system
from the National Youth Survey, 2010

Reason Reported dropout	National Average	Early Dropout	Dropout in Transition	Dropout During USE	Less Dropout
<i>Total Economic Reasons</i>	35.5%	43.8%	37.2%	35.4%	29.1%
I had to work	9.7%	12.7%	10.7%	7.9%	7.0%
I had no money	16.5%	20.9%	18.0%	16.4%	14.0%
I could not pay for school	7.2%	7.3%	6.8%	8.4%	6.5%
My parents did not want me to continue study	2.0%	2.8%	1.6%	2.7%	1.7%
<i>Total Reasons School-Education</i>	42.6%	35.9%	42.6%	42.1%	46.7%
I did not want to continue with studies	13.1%	8.8%	12.5%	17.7%	17.2%
I was bored	15.9%	15.5%	16.6%	14.8%	12.0%
I failed several subjects	9.6%	8.2%	9.1%	6.8%	10.0%
For disciplinary reasons	3.5%	2.9%	3.5%	2.4%	5.6%
The school environment / surroundings was unsafe	0.3%	0.1%	0.7%	0.2%	1.4%
Classmates bothered me a lot	0.3%	0.4%	0.2%	0.1%	0.6%
<i>Total Personal Reasons</i>	9.6%	10.1%	8.2%	8.7%	8.8%
For marriage / union	4.9%	6.5%	4.9%	6.3%	4.7%
Maternity / paternity	3.2%	3.0%	2.4%	1.9%	4.1%
Illness / accident	1.5%	0.6%	0.9%	0.5%	0.0%
<i>Educational Opportunities</i>	7.5%	4.4%	8.2%	6.3%	5.1%
I was not accepted at school	3.2%	1.5%	3.4%	3.0%	1.1%
There was no school	1.1%	0.6%	1.5%	0.8%	0.6%
The school was far	3.2%	2.4%	3.3%	2.4%	3.5%
Other	4.8%	5.8%	3.8%	7.5%	10.1%

Source: Own from the National Youth Survey 2010 estimates.

Table 6

Association between dropout for USE age youth and social factors

Independent Variable	Sample	States	States	States	States
	National	Early Dropout	Dropout in Transition	Dropout During USE	Less Dropout
Size of household	0.002	0.003	-0.005	0.004	0.002
Rural	0.017 *	0.018 *	0.013 **	0.026	0.0001
Sex	-0.014	-0.025	-0.016	-0.015	-0.005
Married or cohabiting	0.031	0.073	0.077 ***	0.024 *	0.000
Medical Service	-0.032 **	-0.041 **	-0.011 **	-0.027 *	-0.02
Educ boss	-0.008 *	-0.006	-0.006 **	-0.007 *	-0.006 *
Educ of spouse	-0.008 **	-0.005 *	0.007 *	-0.003 *	-0.008 *
Head speaks indigenous language	0.014 **	0.022 **	0.004 **	0.004 *	0.005 *
Head unemployed	0.003 **	0.008 **	0.013 *	0.025 *	0.002
Index of assets	-0.008 *	-0.027 **	-0.011 **	-0.017 ***	-0.012 *
<i>Oportunidades</i> Scholarship	-0.005 *	-0.027 **	-0.012 *	-0.009 *	-0.010
Absent parent	0.020	0.030	0.004	0.002	0.008 *
Lives with partner	0.017	0.004	0.037	0.026	0.010
Has experienced violence from partner	0.039	0.023	0.108	0.067	0.004
Had sex before age 15	0.019 *	0.015	0.006	0.011 *	0.012 **
Has been forced to have sex	-0.003	0.097	0.000	0.000	0.000
Has been pregnant or gotten someone pregnant	0.040 *	0.120 **	0.197 ***	0.235 **	0.019 *
Number of children born	0.010	-0.060	0.0144 ***	0.017 *	0.003
Smoke cigarettes regularly	0.012 *	0.016 *	0.028 **	0.011 *	0.0079
Drinking alcohol regularly	0.022 **	0.033 **	0.019 *	0.014 *	0.010 *
Use drug regularly	0.096 ***	0.065 **	0.035 **	0.037 ***	0.108 *

Source: Own calculations. The estimates reported represent the average margins evaluated.

*, **, And *** indicate that the effect is statistically significant at 10%, 5% and 1%, respectively.

Table 7

Estimated association between community factors and dropout

Independent Variable	National Sample Results						Results with States grouped by dropout pattern with Robust Standard Errors						
	Estimation Method		Estimate	M Square Ordinary Weighted	Early Dropout States	States with Dropout in Transition	States with Dropout During USE	States with Low Dropout					
	Errors Standard Robust	VCE											
Results ENLACE USE	-0.036 *	-0.036 *	-0.041 **	-0.020 *	-0.052 *	-0.024 **	-0.209 **						
% In Social Programs	-0.082 ***	-0.082 **	-0.081 ***	-0.0565 ***	-0.155 *	-0.083	-0.127 ***						
% Houses with dirt floors	-0.001	-0.001	-0.003	0.000	0.000	0.000	-0.001						
Rate rurality	0.052 ***	0.052 ***	0.057 ***	0.071 ***	0.079 ***	0.044 ***	0.001						
Infant mortality rate	0.151 *	0.151	0.098	0.020	0.041	0.580 ***	0.226 **						
Unemployment rate	0.292 ***	0.292 ***	0.206 **	0.333 ***	0.550 ***	0.089 *	0.363 **						
% With electricity / water	-0.222 ***	-0.222 ***	-0.215 ***	-0.211 ***	-0.091 *	-0.484 ***	-0.159						
Constant	-0.175	-0.175	-0.160	-0.386	-0.545	0.190	3140						

Source: Own calculations. *, **, And *** indicate that the effect is statistically significant at 10%, 5% and 1%, respectively.

Table 8

Estimated association between macro-aggregate factors and dropout rates with fixed effects

Independent Variable	National Sample	Early Dropout	Dropout in Transition	Dropout During USE	Less Dropout
Returns to Higher Ed	-9.82 ***	-3.82 ***	-5.43 ***	-11.24 ***	-12.21 ***
Returns to USE	-5.56 ***	-5.50 ***	-6.24 **	-5.49 **	-1.07 *
Returns to Secondary Ed	-6.08 ***	-4.86 ***	-3.73 **	-3.45 *	-1.88
Ln GDP per capita	-36.48 ***	-51.10 ***	-43.22 ***	-30.39 ***	-30.90 ***
% Informal employment	0.08 ***	0.10 ***	0.11 **	0.07 ***	0.02
% Female labor participation	0.22 *	0.04	0.05	0.39 ***	0.47 ***
Teachers for USE campus	-0.40 **	-0.40	-0.21 *	-0.76 ***	-0.73 ***
Constant	-355.43	-498.76	-416.76	-293.88	-298.48

Source: Own calculations. *, **, And *** indicate that the effect is statistically significant at 10%, 5% and 1%, respectively.

Table 9

Factors associated with dropout in USE

Dropout	Elements	Variables	Early	Dropout	Dropout	Less
Factors			Dropout	In Transition	During USE	Dropout
Personal		Being indigenous				
		Rural household				
Head of Household		Absent				
		Unemployed				
		Education Level				
Personal and Family	Household Conditions	Income				
		Assets				
		Access to Services				
Community And Social	Social Risks	Early pregnancy				
		Premature children				
	Addictions					
School		Educational Quality				
Macro	Educational returns	Secondary				
		USE				
		Higher Education				

Appendix Table A.1

<i>Socioemotional Strategies</i>
School Transitional Environment Program (STEP) (US): STEP targets transitioning children by creating subgroups to ease their transition to larger classes, with emotional guidance and academic counseling. It had positive impacts on the dropout rate, grades and attendance of students transitioning from middle to high school. (Felner et al., 1993)
Project Graduation Really Achieves Dreams (GRAD) (US): Targeting students in low-income areas, GRAD operates in high school, as well as elementary and middle schools. It works to improve classroom management and discipline, student reading and math proficiency, parent and community involvement, and high school graduation and college acceptances; and provides scholarships. It had positive impacts on student discipline, high school graduation and college attendance rates. (Opuni, K.A., 1999)
Teen Outreach Program (TOP) (US): TOP targets 6th to 12th grade students to prevent problem behaviors, such as teen pregnancy and school failure and dropout. It includes: 1) supervised community volunteer service; 2) classroom-based discussions and activities related to teenage social-development; and 3) group discussions about service experience. Participants experienced lower levels of school failure, school suspension and teen pregnancy than those in control group (Allen et. al 1997).
Additional socio-emotional strategies (Various): Australia’s Youth Connections program provides students at-risk of dropout or dropouts with one on one attention to conclude their studies and support their reconnecting with the family, obtaining a mentor or psychological support. Canada’s Transitions Program is targeted at youth in 7th to 9th grades to help in their transition through guidance and individual support, with a profile of the student and their needs, strengths and interests. Additionally in Canada, the Student Success Team model supports students with a team comprised of the director, teacher and counselor, and a special education teacher. Similarly in Switzerland the Case Management Model identifies socially and academically at risk students and case manager works with students for services such as orientation and tutoring to facilitate transition to USE.
<i>Curricular Strategies</i>
The Early College Highschool Initiative (US): The ECHSI is targeted at low income and minority students typically underrepresented in higher education and provides early exposure to higher education to incentivize retention. Students can take college-level courses and earn college credits during highschool. The program appears to have positive results with respect to student performance, progression through grades for minority students, attendance and academic engagement. ²⁶
Retention Program (Spain): Spain employs an early selection system for upper secondary that allows third grade lower secondary students to take optional courses and differentiated mathematics courses according to their desired USE path. Fourth grade lower secondary students are able to take some courses corresponding to USE. Spain is also tackling dropout due to labor reasons, by facilitating options to study and work at the same time through evening, distance and on-line USE programs.
School completion program (SCP) (Ireland): SCP uses a bottom-up approach in partnership with Local Management Committees to create and implement plans to target youth at risk of early-school leaving. Results appear to have improved retention rates. Under the SCP schools also can participate in the Schools Business Partnership, which includes a mentoring program, the Skills@Work program, a summer work placement program, and Management Excellence for Principals. ²⁷
Other curricular strategies (Various): In Canada, Cooperative Education allows students to earn school credits through work experiences, and Specialist High School Majors orient students towards a professional career according to their interests. In Norway the Praksisbrev (certificate of practice) offers at-risk students the possibility of obtaining work experience. In Chile the “Yo Estudio” e-learning platform offers content in academic subjects and technical-professional training.
<i>Management Strategies</i>
Liceo para todos (LPT) (Chile): LPT aims to reduce upper secondary dropout in the most vulnerable high schools of Chile through: 1) scholarships for school retention; 2) school alignment (ensuring students have proper preparation of skills for their courses); and 3) action plans. Results included that principals and teachers assumed a proactive position towards high school dropout prevention, improving the attendance and repetition levels at the schools. The LPT Action Plans positively changed pedagogical practices. School authorities used the scholarships in order to prevent the need for youth to seek work to cover school costs (Ruiz and Vergara, 2005).
Learning Communities (Spain): <i>Community support to prevent dropout:</i> A promising approach being utilized in Spain is that of Learning Communities. In this approach, regional authorities provide funding to parents associations, and parents and communities are involved in reducing early school leaving. Learning Communities utilize a community-wide approach including consultations, community volunteers, and utilization of innovative pedagogical methods such as learning through interactive groups. The Learning Communities have not undergone formal evaluation, but self-assessments have found apparent positive impacts on achievement and attainment. ²⁸

²⁶ Fifth Annual Early College High School Initiative Evaluation Synthesis Report http://www.air.org/files/ECHSI_Eval_Report_2009_081309.pdf

²⁷ <http://www.newb.ie/publications/scpdocumentation.asp>, http://ec.europa.eu/education/school-education/doc/esl/ryan_en.pdf, <http://www.oecd.org/ireland/49624509.pdf>

²⁸ Reducing Early School Leaving in the EU Study, 2011 <http://www.europarl.europa.eu/studies>